DEPARTMENT OF TRANSPORTATION

TOLL COLLECTION SYSTEM

RFP ISSUED……..…12/16/2011

VENDOR CONFERENCE…….……..…...10:00 AM (EDT), 1/4/2012

AT: Materials And Research Building
5 Hazen Drive, PO Box 483
Concord, NH 03302-0483
Room 205

STATE CONTACT…… John Corcoran, Assistant Administrator, JCorcoran@dot.state.nh.us, Office phone: (603) 485-3806, Mobile: (603) 545-4531

CONTRACT TYPE…… FIRM FIXED PRICE

PROPOSALS DUE……..2:30 PM, 2/16/2012

AT: Christopher Waszczuk
Administrator, Bureau of Turnpikes
36 Hackett Hill Road
Hooksett, NH 03106

 Vendor Initials_____
Date_____

Table of Contents

1. INTRODUCTION

The State of New Hampshire, acting through the New Hampshire Department of Transportation (NHDOT) Bureau of Turnpikes ("The Bureau"), is releasing this Request for Proposal (RFP) to procure a new Toll Collection System.

The NHDOT Bureau of Turnpikes operates a Turnpike System that is comprised of three (3), non-contiguous, limited-access highways: the Blue Star Turnpike (I-95) and the Spaulding Turnpike (collectively referred to the Eastern Turnpike) and the F.E. Everett Turnpike (also known as the Central Turnpike). The Turnpike System is a standard barrier toll collection system providing both slow speed electronic and cash payment. The existing system uses the regional Inter-Agency Group (IAG) Customer Service and Violations Process Center (CSC/VPC) to process E-ZPass (AVI) transactions which will continue to be used on the Agency toll lanes.

1.1 Contract Award

The State plans to execute a Firm Fixed Price (FFP) Contract as a result of this RFP. The award will be based upon criteria, standards, and weighting identified in this RFP. Each Vendor ("Proposer") Proposal will be considered as a whole Solution, without limitation, including all Work proposed, the technical approach, the ability to meet schedule, the maintenance approach, the qualifications of the Vendor and any Subcontractor(s), and costs.

1.1.1 Non-Exclusive Contract

Any resulting Contract from this RFP will be a non-exclusive Contract. The State reserves the right, at its discretion, to retain other vendors to provide any of the Services identified under this procurement.

If a Contract is awarded, the Vendor must obtain written consent from the State before any public announcement or news release is issued pertaining to any Contract award. Such permission, at a minimum, will be dependent upon approval of the Contract by Governor and Executive Council of the State of New Hampshire.

1.2 Contract Term

Time is of the essence in the performance of a Vendor's obligations under the Contract.

The Vendor shall be fully prepared to commence work by May 2012, after full execution of the Contract by the parties, and the receipt of required governmental

approvals, including, but not limited to, Governor and Executive Council of the State of New Hampshire approval ("Effective Date").

The Vendor's term shall begin on the Effective Date and extend through June 30, 2017. The term of interim maintenance period for the existing system will be 7/1/2012 to 6/30/2013. The maintenance and warranty period on the new system begins at provisional final system acceptance (projected to be 7/1/2013) until 6/30/2017. The contract will also include a option for two-2 year optional maintenance periods, at the sole discretion of the State, up to but not beyond June 30, 2021.

The Vendor shall commence work upon issuance of a Notice to Proceed by the State.

The State does not require the Vendor to commence work prior to the Effective Date; however, if the Vendor commences work prior to the Effective Date and a Notice to Proceed, such work shall be performed at the sole risk of the Vendor. In the event that the Contract does not become effective, the State shall be under no obligation to pay the Vendor for any costs incurred or Services performed; however, if the Contract becomes effective, all costs incurred prior to the Effective Date shall be paid under the terms of the Contract.

1.3 Email of Intent to Submit Proposal

Vendors intending to submit a Proposal shall submit an email stating their Intent to Submit Proposal. The email shall be submitted to the same email addresses provided in the Proposal Inquiries section, Section 4.2 herein. Emails shall include the subject line, "Toll Collection System, Intent to Submit". Emails shall be sent by the date and time prescribed in the Schedule of Events section, herein. It is the Vendor's responsibility to ensure that the Agency has received its "Intent to Submit Proposal" email. If a confirmation from the Agency is not received within twenty-four (24) hours from the date and time of submission, the Vendor shall call or otherwise reach the Agency contact provided for the delivery of the RFP to verify receipt.

1.4 Order of Precedence

In the event of conflict or ambiguity among any of the text of the Contract Documents, the following Order of Precedence shall govern:

a) The State of New Hampshire Terms and Conditions, as stated in Appendix H of this RFP.

 Vendor Initials_____

Date_____

b) The State of New Hampshire, Department of Transportation Contract 2012-060 (resulting Contract from this RFP, once executed)

c) RFP 2012-060 and all related attachments, appendices and addendum (if applicable)

d) Final State Responses to Vendor Inquiries

e) The Contractor Proposal to RFP 2012-060.

1.5 Subcontractors

The Vendor shall identify all Subcontractors to be provided to deliver required Services subject to the terms and conditions of this RFP, including but not limited to, in Appendix H Section H-25: *General Contract Requirements* herein and Appendix H: *State of New Hampshire Terms and Conditions* of this RFP.

The Vendor shall remain wholly responsible for performance of the entire Contract regardless of whether a Subcontractor is used. The State will consider the Vendor to be the sole point of contact with regard to all contractual matters, including payment of any and all charges resulting from any Contract.

2. SCHEDULE OF EVENTS

The following table provides the Schedule of Events for this RFP through Governor and Council approval and Notice to Proceed.

EVENT	DATE	LOCAL TIME
RFP Released to Vendors (Advertisement)	12/16/2011	
Public Advertisement Period Ends	12/28/2011	
Vendors Submit email of Intent to Bid/RSVP for Conference	12/28/2011	5:00 P.M.
Vendor Conference; location identified in General Instructions, Section 4.3	1/4/2012	10:00 A.M.
Site Tour; Day and time of the visit to be scheduled at Vendor Conference	1/12/2012 or 1/13/2012	
Vendor Inquiry Period Ends	1/20/2012	5:00 P.M.
Final State Responses to Vendor Inquiries	2/3/2012	5:00 P.M.

 Vendor Initials_____

Date_____

Vendors Submit Proposals	2/16/2012	2:30 P.M.
NHDOT Initial Review Period Complete	3/2/2012	
Questions to Proposers	3/7/2012	
Vendor Oral Presentations and Interviews Begin	3/19/2012	T.B.D.
Proposal Evaluation Completed	3/26/2012	
Vendor Notification of Selection and Begin Contract Negotiations	3/26/2012	
Anticipated Governor and Executive Council Approval	5/9/2012	
Anticipated Notice to Proceed	5/9/2012	

3. SOFTWARE, REQUIREMENTS AND DELIVERABLES

3.1 Software

The State seeks to purchase the Software for this Contract. Each Proposal must present Software that can fully support the required functionality listed in Appendix C: *System Requirements and Deliverables.*

3.2 Requirements

3.2.1 Appendix B: *Minimum standards for Proposal Consideration*, compliance with System requirements, use of proposed COTS Software, Vendor Implementation experience, and proposed Project Team.

3.2.2 Appendix C: Detailed description of the Technical Requirements, Performance Requirements, Work and Deliverables for the Implementation and Maintenance of the Toll Collection System.

3.2.3 Appendix D: Mandatory narrative descriptions of questions and topics to be discussed in the Proposals, which will expound on the Vendors' understanding of the implementation and maintenance requirements and the proposed Toll Collection System.

3.2.4 Appendix E: *Standards for Describing Vendor Qualifications* including Vendor corporate qualifications, team organization and key staff, Project Manager, and other key staff candidates' qualifications.

3.2.5 Appendix F: Price Worksheet Instructions.

3.2.6 Appendix G: Certificates

3.2.7 Appendix H: State of New Hampshire Terms and Conditions

3.2.8 Appendix I: Forms to be completed and Exhibits

3.3 Deliverables

The Contractor shall provide the Agency with the Deliverables in accordance with the requirements, and terms and conditions of the Contract. All Deliverables shall fully meet and perform in accordance with the RFP Documents and resulting Contract(s). Upon its submission of a Deliverable, the Contractor shall represent that it has performed its obligations under the Contract associated with the Deliverable. A definition of a Deliverable is provided in Appendix H.

Unless otherwise stated in the Contract documents, the Agency's review of all Deliverables will be in accordance with the time periods set forth in the Project Plan and Schedule. For each rejection, the Approval Period shall be extended at least one time, and thereafter may be extended, at the option of the Agency, by the corresponding time required to correct any deficiency, retest or review, as applicable, provided however, that the Contractor shall not be obligated to continue performance if it reasonably believes that it cannot correct the deficiency, in which case it shall promptly notify the Agency thereof and the Agency may immediately declare Contractor in Default, avail itself of the remedies available to it in law and in equity.

Once an individual Deliverable is Approved, all sums are due and payable; however, notwithstanding the foregoing, in the event the Agency rejects a Deliverable, the Agency shall have the right to pursue all remedies under the Contract, at law and in equity, including but not limited to, the right to replacement and re-implementation costs. Refer to Appendix H, Section H-25.12.1 Termination for Default.

Deliverables review is further described in Appendix H: Section H25.11.1 *Activities/Deliverables/Milestones Dates and Pricing*.

4. INSTRUCTIONS

4.1 Proposal Submission, Deadline, and Location Instructions

Proposals submitted in response to this RFP must be received by the Department of Transportation, Bureau of Turnpikes, no later than the time and date specified in the Section 2 *Schedule of Events* section, herein. Proposals must be addressed to:

Chris Waszczuk

Administrator, Bureau of Turnpikes

36 Hackett Hill Road

Hooksett, NH 03106

Cartons containing Proposals must be clearly marked as follows:

STATE OF NEW HAMPSHIRE
Department of Transportation Bureau of Turnpikes

RESPONSE TO NHDOT Bureau of Turnpikes RFP 2012-060
Toll Collection System

Note: You must use a ground service (e.g. UPS, FEDEX, ect.) for delivery to this address. The US Mail does not deliver to this location.
Late submissions will not be accepted and will remain unopened. Delivery of the Proposals shall be at the Vendor's expense. The time of receipt shall be considered to be the time when a Proposal has been officially documented by the Bureau Of Turnpikes, in accordance with its established policies, as having been received at the location designated above. The Department of Administrative Services accepts no responsibility for mislabeled mail. Any and all damage that may occur due to shipping shall be the Vendor's responsibility.

Vendors are permitted to submit **only one (1)** Proposal in response to this RFP.

All Proposals submitted in response to this RFP must consist of:

a. One (1) original, Clearly marked as such, and (10) clearly identified copies of the Technical Proposal, including all required attachments

b. One (1) copy of the *Proposal Transmittal Form Letter* (described in Section 4.18.2: *Transmittal Form Letter*, herein) shall be signed by an official authorized to legally bind the Vendor and shall be marked "ORIGINAL."
c. One (1) electronic copy on CD ROM in MS WORD format.

The original and all copies shall be bound separately, delivered in sealed containers, and permanently marked as indicated above. A Vendor's disclosure or distribution of its Proposal other than to the State will be grounds for disqualification.

A separate, sealed envelope shall contain one (1) original (clearly marked as such) and one (1) copy of the Price Proposal and one (1) electronic copy of the Price Proposal in Excel format. The Price Proposal shall be clearly marked "Price Proposal".

4.2 Proposal Inquiries

All inquiries concerning this RFP, including but not limited to, requests for clarifications, questions, and any changes to the RFP, shall be emailed, citing the RFP title, RFP number, page, section, and paragraph and submitted to the following RFP State Point of Contact:

Contact Bureau of Turnpikes by email only, please contact:

TO: John Corcoran, JCorcoran@dot.state.nh.us

CC: Chris Waszczuk, CWaszczuk@dot.state.nh.us

Vendors are encouraged to submit questions via email; however, the State assumes no liability for assuring accurate/complete email transmission/receipt and is not responsible to acknowledge receipt. The Vendor should also identify an email "Subject line" with the phrase "RFP 2012-060 Vendor Inquiry" to identify inquiries coming into the RFP State Point of Contact.

Inquiries must be received by the RFP State Point of Contact (see above) no later than the conclusion of the Vendor Inquiry Period (see Section 2: *Schedule of Events*)(see Appendix I for Vendor Inquiry Form). Inquiries received later than the conclusion of the Vendor Inquiry Period shall not be considered properly submitted and will not be responded to.

The State intends to issue official responses to properly submitted inquiries on or before the date specified in Section 2: *Schedule of Events*; however, this date may be subject to change at the State's discretion. The State may consolidate and/or paraphrase questions for sufficiency and clarity. The State may, at its discretion, amend this RFP on its own initiative or in response to issues raised by inquiries, as it deems appropriate. Oral statements, representations, clarifications, or

modifications concerning the RFP shall not be binding upon the State. Official responses will be made in writing.

4.2.1 Restriction of Contact With State Employees

From the date of release of this RFP until an award is made and announced regarding the selection of a Vendor, all communication with personnel employed by or under contract with the State regarding this RFP is forbidden unless first approved by the RFP State Point of Contact listed in Section 4.2: *Proposal Inquiries*. State employees have been directed not to hold conferences and/or discussions concerning this RFP with any Vendor during the selection process, unless otherwise authorized by the RFP State Point of Contact.

4.3 Vendor Conference

A Mandatory Vendor Conference will be held at the following location on the date and at the time identified in Section 2: *Schedule of Events:*

Department Of Transportation
Material And Research Building
5 Hazen Drive
Room 205
Concord, New Hampshire 03301

All Vendors who intend to submit Proposals must attend the Vendor Conference. Vendors are requested to RSVP to the State Contact via email by the date identified in Section 2: *Schedule of Events*, indicating the number of individuals who will attend the Vendor Conference.

Vendors are allowed to send a maximum number of 3 representatives.

Vendors will have an opportunity to ask questions about the RFP and the State will make a reasonable attempt to answer questions it deems appropriate. Questions may include, without limitation, a request for clarification of the RFP; a request for changes to the RFP; suggestions or changes to the RFP that could improve the RFP competition or lower the offered price; and to review any applicable Documentation.

Vendors are encouraged to email inquiries to the Agency at least twenty-four (24) hours prior to the Vendor Conference. No responses will be given prior to the Vendor Conference. Oral answers will not be binding on the Agency. Only written responses to questions provided by the Vendors in writing shall be binding. The Agency's final response to Vendor inquiries and any requested changes to RFP documents during the Vendor Inquiry Period will be emailed by the date specified as the Final Agency responses to Vendor Inquiries, as specified in the Schedule of Events section, herein. The Agency's final response to Vendor inquiries will also be posted on the Agency website and the names of Vendors issuing specific questions

will not be identified. Vendors are responsible for any and all costs associated with attending the Vendor Conference.

NOTE: The Agency will NOT distribute a list of Vendor Conference Attendees.

4.3.1 Vendor Site Tour

Vendors will be allowed to have a site tour with NHDOT and their team as identified in section 2: Schedule of Events. The vendor shall contact John Corcoran via email or at the vendor conference to schedule the site visit. The vendor must request a site tour. The request must be submitted no later than the day of the vendor conference. The vendor may take pictures of the lanes, tunnels, lane controller cabinets, and booths during this tour. The vendors may ask questions, but oral answers are not binding on the agency. Vendors must submit questions in writing as described in section 4.3

4.4 Alteration of RFP

The original RFP document is on file with the State of New Hampshire, Department of Administrative Services. Vendors are provided an electronic version of the RFP. Any alteration to this RFP or any file associated with this RFP is prohibited. Any such changes may result in a Proposal being rejected.

4.5 RFP Addendum

The State reserves the right to amend this RFP at its discretion, prior to the Proposal submission deadline. In the event of an Addendum to this RFP, the State, at its sole discretion, may extend the Proposal submission deadline, as it deems appropriate.

4.6 Non-Collusion

The Vendor's signature on a Proposal submitted in response to this RFP guarantees that the prices, terms and conditions, and Services quoted have been established without collusion with other Vendors and without effort to preclude the State from obtaining the best possible competitive Proposal.

4.7 Validity of Proposal

Proposals must be valid for one hundred and eighty (180) days following the deadline for submission of Proposals in Section 2: *Schedule of Events*, or until the Effective Date of any resulting Contract, whichever is later.

4.8 Property of the State

All material received in response to this RFP shall become the property of the State and will not be returned to the Vendor. Regardless of the Vendor selected, the State reserves the right to use any information presented in a Proposal unless such material has been marked as "Proprietary and Confidential" or "Trade Secret" by the Vendor in accordance with the State requirements set forth in Appendix H *General Standards and Requirements* herein.

4.9 Confidentiality of a Proposal

A Proposal must remain confidential until the Effective Date of any resulting Contract as a result of this RFP. A Vendor's disclosure or distribution of Proposals other than to the State will be grounds for disqualification.

4.10 Public Disclosure

Subject to applicable law or regulations, the content of each Vendor's Proposal shall become public information upon the Effective Date of any resulting Contract. The vendor may submit a redacted version of the proposal prior to the Governor and Council date.

4.11 Security

The State must ensure that appropriate levels of security are implemented and maintained in order to protect the integrity and reliability of its information technology resources, information, and services. State resources, information, and services must be available on an ongoing basis, with the appropriate infrastructure and security controls to ensure business continuity and safeguard State networks, Systems and data.

The State will evaluate the degree to which the proposed System is designed and architected to ensure the confidentiality and integrity of its valued asset, Data.

In addition, Appendix C: Requirements and Deliverables contains security requirements that are specific to the implementation and maintenance of the Toll System being procured, including requirements for security of customer information and compliance with Payment Card Industry (PCI) requirements. Please refer to Appendix C for more detailed information on these requirements.

4.12 Non-Commitment

Notwithstanding any other provision of this RFP, this RFP does not commit the State to award a Contract. The State reserves the right, at its sole discretion, to reject any and all Proposals, or any portions thereof, at any time; to cancel this RFP; and to solicit new Proposals under a new acquisition process.

4.13 Proposal Preparation Cost

By submitting a Proposal, a Vendor agrees that in no event shall the State be either responsible for or held liable for any costs incurred by a Vendor in the preparation of or in connection with the Proposal, or for work performed prior to the Effective Date of a resulting Contract.

4.14 Oral Presentations/Interviews and Discussion

The State reserves the right to require Vendors to make oral presentations of their Proposals and/or to make available for oral presentations/interviews the key staff involved. All costs associated with oral presentations/interviews shall be borne entirely by the Vendor. Vendors may be requested to provide demonstrations of their proposed Systems as part of their presentations.

4.15 Required Contract Terms and Conditions

By submitting a Proposal, the Vendor agrees that the State of New Hampshire terms and conditions, contained in Appendix H: *State of New Hampshire Terms and Conditions* herein, shall form the basis of any Contract resulting from this RFP. In the event of any conflict between the State's terms and conditions and any portion of the Vendor's Proposal, the State's terms and conditions shall take precedence and supersede any and all such conflicting terms and conditions contained in the Vendor's Proposal.

4.16 Proposal Format

Proposals should follow the following format:

- The Proposal should be provided in a three-ring binder.
- The Proposal should be printed on white paper with dimensions of 8.5 by 11 inches with right and left margins of one (1) inch.
- The Proposal should use Times New Roman font with a size no smaller than eleven (11).
- Each page of a Proposal shall include a page number and the number of total pages and identification of the Vendor in the page footer. Each page shall be numbered consecutively within each section (i.e., 1-1, 1-2…; 2-1, 2-2…; 3-1, 3-2…, etc.), and the page numbers shall be centered at the bottom of each page.
- The proposal should be printed double-sided.
- Tabs should separate each section of the Proposal.

Exceptions for paper and font sizes are permissible for: graphical exhibits, which may be printed on white paper with dimensions of 11 by 17 inches; and material in appendices.

4.17 Proposal Organization

Proposals shall adhere to the following outline and shall have a total page limit of seventy-five (75) pages, excluding the items identified in the table below as not applying to the page limit.

Technical Proposal Page Limit Applicability

Section	Page Limit Applies?(Y/N)
Cover Page	No
Transmittal Form Letter	No
Table of Contents	No
Section I: Executive Summary	Yes
Section II: Glossary of Terms and Abbreviations	Yes
Section III: Responses to Requirements and Deliverables Compliance Matrix	No
Section IV: Narrative Responses	Yes
Section V: Corporate Qualifications *	No
Section VI: Qualifications of Key Staff *	No
Section VII: Cost	No
Section VIII: Copy of Signed and Initialed Original RFP	No
Section IX: Forms	No
Attachment A: Project Organization Charts	No
Attachment B: Preliminary Project Schedule	No
Attachment C: Equipment Cut Sheets	No
Attachment D: Financial Information	No
Attachment E: Proposed Escrow Agreement	No
Attachment F: Post Warranty Software Agreement	No
Price Proposal	No (Excel Spreadsheet)

* All Forms and Exhibits are provided in Appendix I.

4.18 Proposal Content

4.18.1 Cover Page

The first page of the Vendor's Proposal should be a cover page containing the following text:

STATE OF NEW HAMPSHIRE
Department of Transportation Bureau of Turnpikes

RESPONSE TO Bureau of Turnpikes RFP 2012-060
Toll Collection System

The cover page should also include the Vendor's name, contact person, contact telephone number, address, city, state, zip code, fax number, and email address.

4.18.2 Transmittal Form Letter

The Vendor must submit signed Transmittal Form Letter with their response using the Transmittal Form Letter Template provided herewith. Any electronic alteration to this Transmittal Form Letter is prohibited. Any such changes may result in a Proposal being rejected. See Appendix I for template.

State of New Hampshire Proposal Transmittal Form Letter

Company Name_____

Address_____
_____

To: NH Department of Transportation State Point of Contact: _____
Telephone (603) 485-3806
Email: Jcorcoran@dot.state.nh.us

RE: Proposal Invitation Name: Toll Collection System
Proposal Number: 2012-060
Proposal Due Date and Time: 2/16/2012 @ 2:30 PM

Dear Sir:

Company Name: _____ hereby offers to sell to the State of New Hampshire the Services indicated in RFP NH Department of Transportation 2012-060 Toll Collection System at the price(s) quoted in Vendor Response Section VII: *Cost Proposal*, and Appendix I: *Pricing Worksheets*, in complete accordance with all conditions of this RFP and all Specifications set forth in the RFP and in the State of New Hampshire Terms and Conditions outlined in RFP Appendix H: *State of New Hampshire Terms and Conditions*.

Company Signor: _____ is authorized to legally obligate

Company Name: _____.

We attest to the fact that:

The company has reviewed and agreed to be bound by all RFP terms and conditions including but not limited to the *State of New Hampshire Terms and Conditions* in Appendix H, which shall form the basis of any Contract resulting from this RFP; No new terms and conditions have been added and no existing terms and conditions have been deleted in this RFP Proposal.

The Proposal is effective for a period of 180 days or until the Effective Date of any resulting Contract.

The prices quoted in the Proposal were established without collusion with other eligible Vendors and without effort to preclude the State of New Hampshire from obtaining the best possible competitive price; and

The Vendor has read and included a copy of RFP 2012-060 and any subsequent signed Addendum (a).

 Vendor Initials_____

Date_____

Our official point of contact is
_____

Title
_____

Telephone_____,
Email_____

Authorized Signature Printed
_____

Authorized Signature
_____

4.18.3 Table of Contents

The Vendor must provide a table of contents with corresponding page numbers relating to its Proposal. The table of contents must conform to the outline provided in Section 4.17: *Proposal Organization*, but should provide detail, e.g., numbering, level of detail.

4.18.4 Section I: Executive Summary

The executive summary must identify how the Vendor satisfies the minimum standards for consideration, which are described in Appendix B: *Minimum Standards for Proposal Consideration*, to this Request for Proposals. The executive summary will also provide an overview of the Vendor's proposed Solution, System and Services. Vendors are encouraged to highlight those factors that they believe distinguish their Proposal.

4.18.5 Section II: Glossary of Terms and Abbreviations

The Vendor must provide a glossary of all terms, acronyms, and abbreviations used in its Proposal.

4.18.6 Section III: Responses to System Requirements and Deliverables

Requirements are provided in Appendix C: Requirements and Deliverables, included in this RFP. All requirements are considered mandatory features of the proposed solution. All Proposers shall be required to complete and submit the Compliance Matrix, included in Appendix I, which covers all requirements of Appendix C. If the Proposer does not comply with any requirement(s) of the Scope of Work, the specific requirement(s) to which exception is taken must be identified on the Compliance Matrix and briefly explained in the comments column. Failure to take exception in the manner set forth above will be deemed a waiver of any objection. Exceptions may be considered during the Proposal evaluation process at the sole discretion of the Agency; however, the Agency is under no obligation to accept such exceptions.

4.18.7 Section IV: Narrative Responses

Section IV solicits narrative responses to questions and topics specific to the Project. Appendix D: Topics for Mandatory Narrative Responses is organized into sub-sections, which correspond to the different Deliverables of the Proposal.

4.18.8 Section V: Corporate Qualifications

Section V should provide corporate qualifications of all firms proposed to participate in the Project. Specific information to be provided is described in Section E-1: *Required Information on Corporate Qualifications* of Appendix E: *Standards for Describing Vendor Qualifications.* See forms 1-3 in Appendix I.

4.18.9 Section VI: Qualifications of key Vendor staff

This Proposal section must be used to provide required information on key Vendor staff. Specific information to be provided is described in Sections: E-2: *Team Organization and Designation of key Vendor staff;* E-3: *Candidates for Project Manager;* and E-4: *Candidates for key Vendor staff Roles,* of Appendix E: *Standards for Describing Vendor Qualifications*. See form in Appendix I.

4.18.10 Section VII: Cost Proposal

The Price Proposal must be completed in Excel format in accordance with the instructions and must be provided in accordance with the instructions set forth in Appendix F.

4.18.11 Section VIII: Copy of the initialed RFP and any signed Addendum(a) - *required in original Proposal only*

Remainder of this page intentionally left blank

5. PROPOSAL EVALUATION PROCESS

5.1 Scoring Proposals

Each Proposal will be evaluated and considered with regard to the Solution and Services proposed, qualifications of the Vendor and any Subcontractors, experience, and qualifications of proposed candidates, and cost.

The State will issue an intent to award notice to a Vendor based on these evaluations. Should the State be unable to reach agreement with the Vendor during Contract discussions, the State may then undertake Contract discussions with the second preferred Vendor and so on. Such discussions may continue at the sole option of the State, until an agreement is reached, or all Proposals are rejected.

The State will use a scoring scale of 100 points, a maximum of 40 points awarded based on the Price Proposal and a maximum of 60 points awarded for the Technical Proposal. The maximum points that will be awarded are shown in the table below.

CATAGORIES	POINTS
TECHNICAL PROPOSAL with the following potential maximum scores for each Technical Proposal category;	**60**
Toll System Design and Technical Approach (30%)	*18*
Ability to Execute and Meet the Project Schedule (30%)	*18*
System Maintenance and Warranty Approach (20%)	*12*
Firms Qualifications, Project Team, Capabilities and References (20%)	*12*
PRICE PROPOSAL POTENTIAL MAXIMUM POINTS	**40**
TOTAL POTENTIAL MAXIMUM POINTS AWARDED	**100**

5.2 Rights of the State in Evaluating Proposals

The State reserves the right to:

a. Consider any source of information in evaluating Proposals;
b. Omit any planned evaluation step if, in the State's view, the step is not needed;
c. At its sole discretion, reject any and all Proposals at any time; and
d. Open Contract discussions with the second highest scoring Vendor, if the State is unable to reach an agreement on Contract terms with the highest scoring Vendor.

5.3 Planned Evaluations

The State plans to use the following process:

- Initial screening:
- Preliminary scoring of the Proposals and reference and background checks;

- Oral interviews and product demonstrations;
- Final evaluation of Proposals.

5.3.1 Initial Screening

The Agency will conduct an initial screening step to verify Vendor compliance with submission requirements and to confirm that the Proposal satisfies the following:

- The proposal is date and time stamped as received by the Agency before the deadline.
- The Vendor has sent the proper number of copies as set forth in accordance with requirements herein.
- The original version of the Technical and Price Proposals are marked "ORIGINAL" and the copies are marked "COPY."
- The original Proposal includes a signed Transmittal Letter accepting all terms and conditions of the RFP without exception.
- The proposed Solution meets the requirements as specified in Appendix B of the RFP: Minimum Standards for Proposal Evaluation.

A Proposal that fails to satisfy either submission requirements or minimum standards may be rejected without further consideration.

5.3.2 Preliminary Scoring of Proposals and Reference and Background Checks

The State will establish an evaluation team to initially score Proposals, and conduct reference and background checks.

5.3.3 Oral Interviews and Product Demonstrations

Preliminary scores from the initial evaluation of the Proposals will be used to select Vendors to invite to oral interviews and product demonstrations.

The purpose of oral interviews and product demonstrations is to clarify and expound upon information provided in the written Proposals. Vendors are prohibited from altering the basic substance of their Proposals during the oral interviews and product demonstrations.

For each invited Vendor, the oral interview and product demonstrations will be two (2) hours in length. A highly structured agenda will be used for oral interviews and product demonstrations to ensure standard coverage of each invited Vendor. Information gained from oral interviews and product demonstrations will be used to refine scores assigned from the initial review of the Proposals.

5.3.4 Final Evaluation

The State will conduct final evaluations as a culmination of the entire process of reviewing Vendor Proposals and information gathering. After making a preliminary determination of award, the State reserves the right to conduct

site visits to a Vendor location and/or government site(s) that utilizes the Vendor Software.

5.4 Scoring Detail

The State will select a Vendor based upon the criteria and standards contained in this RFP and from applying the weightings in this section. Oral interviews and reference checks will be used to refine and finalize preliminary scores.

5.4.1 Calculation of Technical Scores

a. In the Technical Evaluation Vendors will be evaluated based on the criteria outlined in Sections 5.4.2 through 5.4.5. Actual evaluator scores based on the potential maximum points shown in the section entitled Scoring will be added for a total of Technical points for each Vendor and then the Technical points for each Vendor will be divided by the number of evaluators to determine the Technical Score for each Vendor.

b. The minimum acceptable Technical Score will be Forty-two (42) points out the possible total of 60 points. Any proposals that do not receive a Technical Score of Forty-two (42) or higher will be removed from further consideration and the corresponding Price Proposal will not be opened and shall be returned unopened to the applicable Vendor.

5.4.2 Scoring of the Proposed Toll Collection System Design and Technical Approach (18 Points)

When evaluating the Vendors' Toll Collection System Design and Technical Approach the evaluation will center on:

a. Design of the System/Solution to meet the specified requirements: including the documentation of the proposed System design and approach to Work; demonstration of a logical and thorough approach to design and development; and thoroughness in addressing System requirements.

b. Transactional and Financial Tracking, Reporting and Reconciliation: Demonstration of capability to efficiently design, develop, test, and implement a flexible, fault tolerant and auditable System that addresses the State's tracking, reporting and reconciliation requirements; and further, demonstration that the proposed System will be easy for the State to understand, operate and modify as necessary to ensure and facilitate ongoing and seamless tracking, reporting and reconciliation of all data related to the Toll Collection System operation.

c. System Performance and Reliability: Proposed system performance and actual documented performance of installed systems on similar projects; and where applicable, use of components and systems proven in operation on other projects.

d. Evidence of willingness to exceed project requirements.

e. Ability to work and perform in a multi-solution, multi-vendor, environment such as the State environment and to cooperate with other vendors in the development and implementation of necessary system interfaces.

f. Flexibility of the proposed Software Solution with regard to the State's right to use and operate after the conclusion of the Contract.

5.4.3 Scoring of Vendor's Ability to Execute and Meet the Project Schedule (18 Points)

When evaluating the Vendors' Ability to Execute and Meet the Project Schedule the evaluation will center on:

a. Demonstration of ability to meet or exceed the scheduling requirements of the Project, including meeting the required Live Date.
b. Demonstration of ability to implement the System safely and with a minimum disruption to the traveling public.
c. Vendors shall present a feasible and comprehensive Project Management Plan that addresses the program requirements within the prescribed timeframe. Focus shall be on:
    i Logic, clarity and specificity of work plan.
    ii. Demonstration of plan for coordination with the CSC contractor, the ORT contractor and the existing toll system maintainer.
    iii. Organization, logic, quality and appropriateness of labor distribution relative to scope of work.
d. Logical approach to Project phasing and transition.

5.4.4 Scoring of Vendor's System Maintenance and Warranty (12 Points)

When evaluating the Vendors' System Maintenance and Warranty Approach the evaluation will center on:

a. Demonstration of ability to meets or exceed all Maintenance Services and warranty requirements as specified in Appendix C: Requirements and Deliverables.

b. Demonstration of innovation in the approach to Maintenance will be evaluated. Innovation means providing materials, operating efficiencies, and equipment that will reduce the long-term Maintenance and operating expenses of the Project and enhance System performance and equipment component life. The evaluation will consider innovative and thoughtful approaches on how to provide efficient and productive maintenance on the System.

c. Maintenance Coordination – Demonstrated ability and willingness to maintain Vendor's System and to coordinate the delivery of maintenance services with the existing toll system maintenance contractor and the CSC/VPC operator in a manner that benefits the State.

d. Serviceability – Demonstrated serviceability of components and the overall System. Serviceability is defined as the ease with which maintainers can remove, replace and repair components without affecting traffic.

e. Provide a solution that allows the State the viable option to monitor and potentially maintain or assist in the maintenance of the Toll Collection System.

5.4.5 Scoring of Vendor Qualification, Project Team, Capabilities and References (12 Points)

When evaluating the Proposers Qualification, Project Team, Capabilities and References the evaluation will center on:

a. Evidence of experience with projects (including design, implementation, and maintenance) of similar size and nature.

b. Time commitment of key Vendor personnel to this Project.

c. Local presence of key Vendor personnel.

d. Demonstrated relevant experience of the project manager, task managers and other key personnel.

e. Evidence of key Vendor personnel in similar roles in example projects.

f. References based on reference forms and subsequent follow-up by the State.

g. Experience, technical competence and role of Subcontractors, including but not limited to Subcontractors' prior working relationships with the Vendor.

5.4.6 Calculation of the Price Proposal Score (40 Points)

The Vendor's Price Proposal will be allocated a maximum potential score of 40 points. The Agency will consider the cost of Implementation, Future Hardware, and 5 year maintenance cost, as well as the cost of options identified in Appendix F: Cost Worksheet Instructions. The basis for the Price Proposal evaluation will be the Total Contract Cost (Sheet 1 entitled "Project Summary Sheet") from the Price Proposal. Cost information required in a Proposal is intended to provide a sound basis for comparing costs. Future options costs will not be part of the scoring but will be a consideration in the review.

The following formula will be used to assign points for costs:

> Vendor's Price Score = (Lowest Proposed Price / Vendor's Proposed Price) x 40

For the purpose of use of this formula, the lowest proposed price is defined as the lowest price proposed by a Vendor who has scored 42 or higher on the Technical Score.

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APPENDIX A: BACKGROUND INFORMATION

A-1 Bureau of Turnpikes (Agency)

See Appendix C for more information on the background of the Project as related to the Agency.

A-2 Department of Information Technology and Technology Status

The Project will be conducted in cooperation with the New Hampshire Department of Information Technology (DoIT). DoIT coordinates the statewide Information Technology activities.

A-2.1 New Hampshire Information Technology Plan (NHITP)

The Department of Information Technology published a State of New Hampshire Information Technology Plan (NHITP). The New Hampshire Information Technology Plan contains the vision, goals, and strategy for the electronic delivery of government services on the Internet and details future e-government direction and implementation strategy. The NHITP helps government leaders anticipate and respond to significant external changes, accelerates IT learning across State agencies, and leverages investments in information technology across State agencies.

A-2.2 Technical Architecture

Components of the State's technical architecture include:

- State Network Environment: The State operates multiple wide-area networks using various technologies including frame relay, fiber, dedicated lines, wireless, Voice over IP (VOIP) and VPN technologies. Networks have varying levels of integration and connectivity to the statewide core for resource sharing and centralized administration by the Department of Information Technology (DoIT). Direct support is provided for twenty-one partner agencies; other State agencies support their own networks, out-source the support, or use the resources of another agency.

- Internet Access: All State agencies are connected to the State's intranet which is being redesigned to function as the statewide core network in addition to facilitating access to e-mail, the Internet, and the State's financial applications. Some agencies additionally have their own Internet service providers. PCI Compliance is also an element in this effort.

A-2.3 Future Systems Environment

Future design and development efforts should conform to the emerging environment as defined by current information technology initiatives, the New Hampshire Statewide Strategic Information Technology Plan, and the State's e-Government Architecture Plan.
This environment is end user centric, utilizing the Internet and Web whenever possible, promoting electronic transactions, and centralized common services (security, e-payment, content search), where possible.

A-3 Current Interfaces

Table A-3 – 1: Interfaces

Agency Name	Import or Export	Function	Frequency
ACS Customer Service Center	Export	Send Violation Images to CSC for violation processing	Live
ACS Customer Service Center	Import	Receive Transponder Status File to update lanes.	Daily
ACS Customer Service Center	Export	Send E-ZPass transactions to CSC for processing.	Daily
ORT System	Import	Receive E-ZPass transaction from the ORT vendor for processing	Hourly
ORT System	Export	Send Transponder Status File to ORT System	Daily

A-4 Related Documents Required at Contract time

a. Certificate of Good Standing/Authority (Appendix G-) dated after April of the current year and available from the Department of State by calling (603) 271-3244 or (603) 271-3246. Forms are also available on: www.sos.nh.gov/corporate/Forms.html
b. Certificate of Vote (Appendix G)
c. Proof of Insurance compliant with Appendix H: *State of New Hampshire Terms and Conditions*.

A-5 State Project Team

State high-level staffing for the project will include:

John Corcoran Bureau of Turnpike – Project Manager

Bill Cyr – Assistant Project Manager and DoIT Liaison

Siegfried Baumer – Network Administrator

Steve Welch – Database Administrator

A-5.1 Project Sponsor

The Project Sponsor, the Bureau of Turnpikes (Agency) and the Commissioner will be responsible for securing financing and resources, addressing issues brought to his attention by the Agency Project Manager, and assisting the Agency Project Manager in promoting the project throughout the Agency. The Project Sponsor or an appropriate designee will be available to resolve issues on a timely basis.

A-5.2 State Project Manager

The Agency Project Manager major duties will include:

- Lead the Project;
- Oversee Project's acceptance, planning, implementation and follow-up issues
- Contact point for coordination and management of Project Implementation Plan with the Vendor and State's Project team
- Coordinate/plan with Vendor testing, conversion and implementation of the Project
- Facilitate Project strategy and approach;
- Engage and manage Vendor;
- Manage significant issues and risks; and
- Manage stakeholders' concerns.

APPENDIX B: MINIMUM STANDARDS FOR PROPOSAL CONSIDERATION

A Proposal that fails to satisfy the requirements in this section may be rejected without further consideration.

B-1 Submission requirements

- The Proposal is date and time stamped before the deadline as defined in Section 2: *Schedule of Events*. The Vendor has sent the proper number of copies with the original version of the Proposal marked "ORIGINAL" and the copies marked "COPY" as defined in Section 4.1: *Proposal Submission, Deadline and Location Instructions*
- The original Proposal includes a signed Transmittal Letter accepting all terms and conditions of the RFP without exception
- The proposed escrow agreement shall be submitted with the Vendor's Proposal for review by the State.

B-2 Compliance with System Requirements

Requirements and Deliverables are listed in Appendix C: Requirements and Deliverables in this RFP. See Section 4.18.6 of this RFP for more information on exception handling.

B-3 Current Use of Vendor Proposed Software – Current Implemented Sites of Vendor proposed software

Components that constitute the Vendor's proposed Software suite must be fully implemented and operational in at least one (1) Toll Agency comparable in size and complexity to the State of New Hampshire.

B-4 Vendor Experience

a. The Vendor must have been responsible for the implementation of at least one (1) in-lane toll system within the E-ZPass Interagency Group (IAG). The specific experience and project must be described within the Proposal in the Prior Project Descriptions section as one of the designated projects. The contents of this section are described in Appendix E: Standards for Describing Vendor Qualifications.

b. The Vendor must have designed, developed, installed and maintained for a minimum period of one (1) year a minimum of two (2) in-lane toll systems (one of which must be within the IAG as described above in B4-a).

B-5 Proposed Project Team

The proposed Project Team must include individuals with substantial experience in:

1. Project Principal: Shall have been full time employee of the Proposer or its parent company for at least one (1) year and have a minimum of ten (10) years experience in the toll/revenue collection industry or similar industry, with five (5) years of senior management responsibility for major projects. Shall have senior management responsibility for at least one (1) project of ten million dollars ($10,000,000) or more in value.

2. Project Manager: Shall have at least five (5) years experience in the toll/revenue collection industry or similar industry, of which the last three (3) years shall have been as project manager of toll collection projects similar to this Project. Shall have been project manager for at least one (1) project of five million dollars ($5,000,000) or more in value.

3. Quality Assurance Manager: Shall have been a quality assurance manager for at least three (3) years on similar projects in the toll collection industry or related industry.

4. Assistant Project Manager: Shall have at least three (3) years experience in the toll collection or related industry, with at least one (1) year of management work on toll collection projects.

5. Technical (Software) Manager: Shall have a minimum of five (5) years of software development management experience, including at least two (2) years experience in software development/management of toll/revenue collection projects of similar nature to this Project.

6. Installation Manager: Shall have at least three (3) years of experience in the toll collection or related industry, with at least two (2) years

experience in a responsible installation management role on toll collection projects.

7. Maintenance Manager: Shall have at least three (3) years experience in maintaining toll collection systems with at least one (1) year experience in the management of maintenance of toll collection systems.

For the purpose of evaluating compliance with this requirement, the Vendor team is permitted include Subcontractors. In addition, one (1) team member may be identified to fulfill the experience requirement in multiple areas.

See separate document for appendix C

Appendix C – Requirements & Deliverables

C-1. PROJECT OVERVIEW

C-1.1. Project Goals

The purpose of this project is to acquire a new Conventional Cash/E-ZPass Toll Collection System (TCS) through an upgrade process by utilizing existing hardware where practical, replacing the TCS Software, and securing ongoing maintenance services. To fulfill these intentions, the following project goals have been established:

Goal 1: Obtain TCS maintenance services for the current ("legacy") system until the TCS upgrade has been completed.

Goal 2: Acquire a new TCS with a primary focus on replacing the legacy system software and hardware over the initial five (5) year term while reusing existing lane system hardware.

Goal 3: Obtain additional functionality and hardware currently not supported by the legacy system including but not limited to a new Violation Enforcement System (VES), Maintenance On-Line Management System (MOMS), and optional Digital Video Audit System (DVAS).

Goal 4: Remove Unused Existing Infrastructure. The Contractor shall be responsible for removal and disposal of existing toll equipment from toll lanes via the NHDOT's disposal process.

Goal 5: Obtain on-going TCS maintenance services for the upgraded TCS software and hardware.

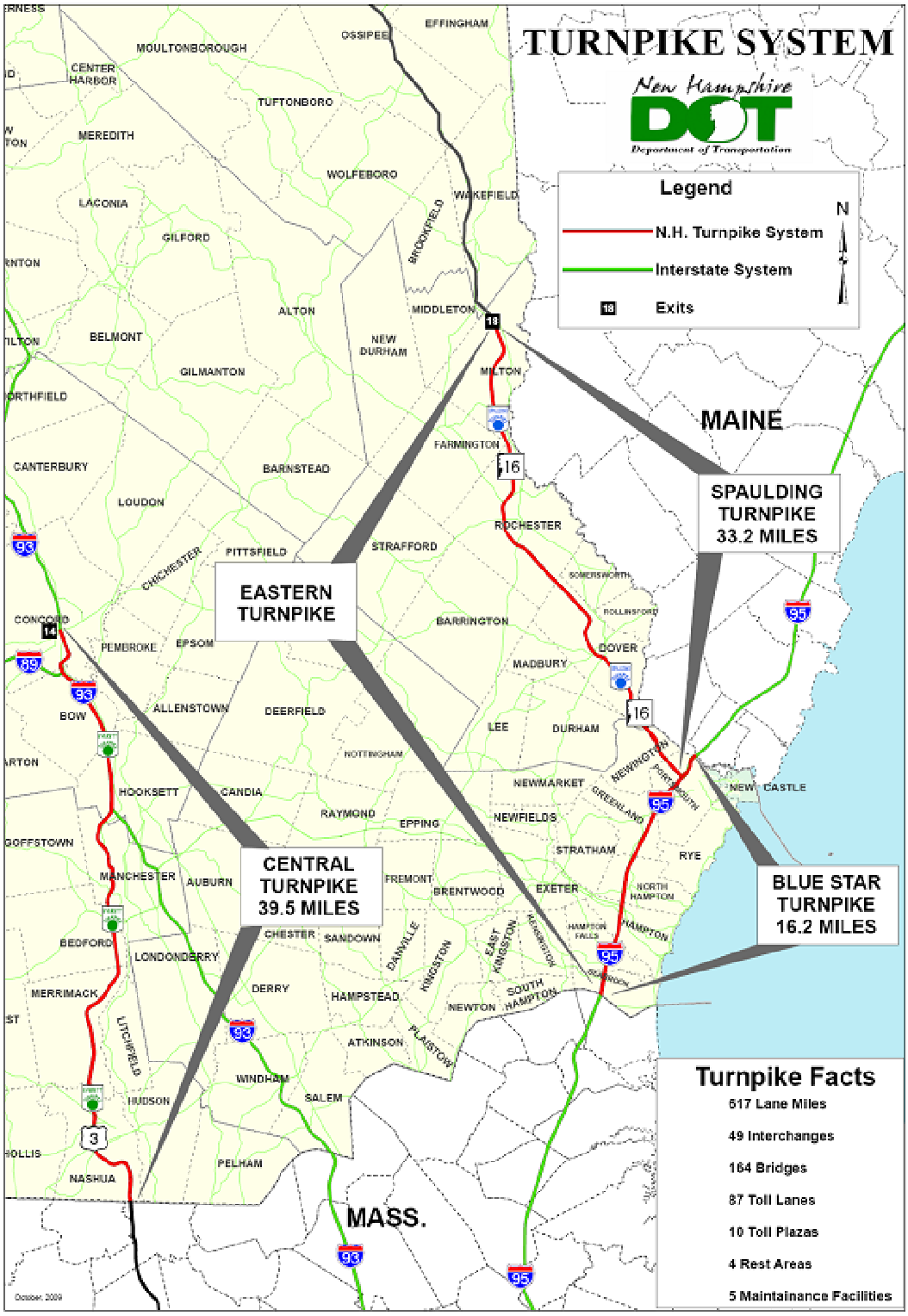
The project will be delivered in three (3) distinct phases. Phase I will commence upon issuance of NTP with the Selected Contractor assuming all legacy system maintenance efforts on July 1, 2012. Phase II will also commence upon issuance of NTP and involve the design, development and deployment of the new TCS upgrade. It is expected that Phase II will be completed no later than June 30, 2013. Upon completion of Phase II, Phase III will begin with complete maintenance support of the new TCS.

C-1.2. Existing System Description

C-1.2.1. Turnpike System

The NHDOT Bureau of Turnpikes operates a Turnpike System that is comprised of three (3), non-contiguous, limited-access highways: the Blue Star Turnpike (I-95) and the Spaulding Turnpike (collectively referred to the Eastern Turnpike) and the F.E. Everett Turnpike (also known as the Central Turnpike) as shown in Figure 1. The Turnpike System is a standard barrier toll collection system providing both slow-speed and high-speed electronic toll collection as well as cash payment at 10 toll plazas.

Figure 1-1: New Hampshire Turnpike System



The Central or F.E. Everett Turnpike is the longest at 44.6 miles, extending from the Massachusetts State Line in Nashua, New Hampshire to Exit 14 in Concord, New Hampshire.

It comprises, in part, a portion of the US Interstate Highways 93 and 293 and connects the three largest cities in New Hampshire (Nashua, Manchester and Concord). The Central Turnpike also connects with major east-west highways such as NH 101, US 4 as well as Interstate 89. Currently there are two mainline toll plazas at Hooksett and Bedford, and 4 ramp plazas at Hooksett, Bedford Road (Exit 12), Continental Boulevard (Exit 11), and Merrimack Industrial Drive (Exit 10).

The Blue Star Turnpike extends from the Massachusetts state line in Seabrook, New Hampshire to the Maine state line in Portsmouth, New Hampshire. It is 16.2 miles in length and constitutes a portion of Interstate 95. It connects with major highways that include NH 101, US 4 and the Spaulding Turnpike. At Portsmouth, the Blue Star Turnpike splits into two segments, one segment merging with the Spaulding Turnpike, and the other with the Maine Turnpike via the Piscataqua River Bridge. There is a single mainline toll plaza and a ramp toll plaza on the Blue Star Turnpike, both located in the Town of Hampton.

The Spaulding Turnpike is 33.3 linear miles, extending from Portsmouth, New Hampshire, to Exit 18 in Milton, New Hampshire. It is the major north-south road in the eastern portion of the state, and connects the Blue Star Turnpike to NH 16, which is the major roadway to northern New Hampshire along the eastern border of New Hampshire. It also connects the three major cities in eastern New Hampshire (Portsmouth, Dover and Rochester) and connects to several major highways that include US 4, NH 16, NH 125 and Interstate 95. There are two mainline toll locations at Dover and Rochester. The Spaulding Turnpike and Blue Star Turnpike are also collectively known as the Eastern Turnpike.

C-1.2.2. Existing Toll Collection System Description

The existing NHDOT Toll Collection System (TCS) consists of a Conventional Cash/E-ZPass Toll Collection System which was implemented at each of the 10 toll plazas in 2005 by The Revenue Markets, Inc. (TRMI). In addition, there is a separate and fully-integrated Open Road Tolling (ORT) System that was implemented and is currently maintained at the Hampton Mainline toll plaza in 2010.

Both Conventional and ORT toll collection systems are comprised of an Automatic Vehicle Identification (AVI) Subsystem, an Automatic Vehicle Classification (AVDC) Subsystem, Speed Detection Subsystem and a Violation Enforcement Subsystem (VES). All E-ZPass toll transactions and violation transactions are processed by the NHDOT's E-ZPass Customer Service Center (CSC) and Violations Processing Center (VPC).

The Conventional TCS also includes conventional cash collection equipment such as Automatic Coin Machines (ACMs), Toll Terminals, Receipt Printers, Patron Fare Displays, Attendant Identification Displays and Traffic Lights. Maintenance of the Conventional TCS is currently provided by TRMI and the term of this current maintenance agreement is set to expire in June 30th of 2012.

It should be noted that this RFP pertains to only the Conventional TCS. The current Hampton Open Road Tolling (ORT) System is provided and maintained by others and is not part of this RFP.

The Conventional Cash/E-ZPass TCS can be categorized into the following subsystems:

1. Lane System
2. Plaza System
3. Host System
4. Communications System (LAN/WAN)

The Lane System consists of the following hardware categories and items:

- E-ZPass Automatic Vehicle Identification Kapsch (formerly Mark IV) readers, RF modules and antennas, cables, mounting brackets and reader cabinet)
- Automatic Vehicle Classification (loop detectors, treadles, overhead laser scanners)
- Violation Enforcement (In Dedicated Lanes), (cameras, image capture cards, triggering and illumination)
- Lane Controllers (computers, drives, boards and serial I/O)
- Automatic Coin Machines (coin sorters, coin paths, dual and triple vault systems, portable bar code readers)
- Toll Terminals (touch screens and mounting arms)
- Receipt Printers
- Attendant Identification Displays
- NEMA Equipment Cabinets
- Canopy Traffic Lights and Override Switches (including Interlock functionality for reversible lanes)
- Patron Fare Displays
- Island Traffic Lights
- Uninterrupted Power Supplies

The basic functionality of the Lane System is to detect vehicles, classify them according to NHDOT's business rules, apply the appropriate toll rate, collect cash, capture pictures of vehicles license plates (front and rear), provide feedback to the driver and create toll transactions for each vehicle.

The Plaza System consists of the following hardware items installed at each toll plaza:

- Plaza Workstations
- Printers
- Bar Code Readers (for money bag tracking)
- Violation Enforcement System (VES) Server
- Uninterrupted Power Supplies

The basic functionality of the Plaza System is to accommodate lane monitoring; toll collection staff management and collector cash out functions.

The Host System consists of the following hardware items:

- Database Server
- Web Server
- Communications Server
- RAID Data Storage
- Tape Backup

The NHDOT TCS Host located at the John O. Morton Building in Concord, NH is the central location where all lane and system data is transmitted and processed. Additionally, the ORT Host also transmits toll and violation transactions to the NHDOT TCS Host. The NHDOT TCS Host is the link between the Conventional TCS, the ORT TCS and the E-ZPass CSC/VPC.

The Communications System or Local/Wide Area Network (LAN/WAN) System consists of the following hardware items:

- Switches
- Fiber to Ethernet Converters
- Broadband Cable Internet (including a Host Router VPN Server and VPN Clients installed on Plaza Routers)
- Modems and Routers
- T-1 Lines

The LAN and WAN systems provides the means for all data to be transmitted among Lane, Plaza and Host Systems and onto the E-ZPass CSC/VPC.

A full inventory of existing Conventional Cash/E-ZPass TCS hardware currently installed and operating on the New Hampshire Turnpike System is documented in Appendix I.

Additional information regarding Vehicle Classification Listing, Business Rules and other documents is contained in Appendix I.

C-1.3. Hooksett Plaza ORT Implementation

The NHDOT will be implementing Open Road Tolling (ORT) at the Hooksett Toll Plaza under a separate procurement known as the "Hooksett 15803 – Open Road Tolling (ORT) Project." Hooksett 15803 is scheduled to be put out for bid in the January to February 2012 time frame. The project will run concurrently with the new Conventional Cash/E-ZPass TCS project (this RFP). Included in the Hooksett ORT contract is the requirement that the Construction Contractor shall hire the new TCS (this RFP) Contractor as its Subcontractor.

The Contractor shall be willing to enter into a separate subcontract with the Construction Contractor to perform this work. All payments for this work will be through the Hooksett 15803 project and will not be a part of this RFP Contract.

The Hooksett 15803 project will reconstruct the approaches to the Hooksett plaza and widen the plaza by four (4) lanes, two (2) in both the NB and SB directions. The middle 6 lanes of the plaza will be removed to accommodate ORT lanes. The Subcontractor shall remove all existing equipment in the lanes to be delivered to the NHDOT. The Subcontractor shall also install new toll equipment provided by NHDOT in the new conventional lanes at the plaza. Equipment in the ORT lanes will be installed by the ORT Vendor (Telvent). There are design issues regarding cabling, equipment location, power, and synchronization of the AVI readers and data file transfer as per the ICD. These issues shall require detailed coordination between Telvent, the Construction Contractor and the Successful Proposer of this RFP.

The Hooksett 15803 project is expected to begin immediately after the notice to proceed (NTP) is issued which is anticipated to in April 2012. Construction on the plaza is expected to start in June or July 2012 and be completed in September or October of 2012. The new conventional TCS equipment installation is expected to begin at this time. The removal of the middle lanes is expected to be in November 2012. The Hooksett Construction Contractor is expected to submit a final schedule immediately after NTP. All of the Hooksett construction and ORT implementation is expected to be completed during the interim maintenance period of July 1, 2012 to June 30, 2013. The Special Provision for this work is included in Appendix I.

C-2. PHASE I – EXISTING SYSTEM INTERIM MAINTENANCE REQUIREMENTS

C-2.1. Scope of Work

The Contractor shall provide temporary maintenance for the legacy TCS herein referred to as Interim Maintenance. The purpose of Interim Maintenance is to maintain the legacy TCS in a sufficient manner to support toll operations and revenue collection until the Contractor has completed full implementation of the TCS Upgrade.

Since the legacy TCS operates on a software design proprietary to TRMI, NHDOT has retained TRMI on a time and materials basis agreement to address critical failures that may not be capable of being solely addressed by the Contractor. During the Interim Maintenance period between July 1, 2012 and June 30, 2013, if a failure or fault occurs that may require TRMI software support, the Contractor shall work with the NHDOT to determine the exact issue and requested support from TRMI. Furthermore, the Contractor shall work with TRMI in supporting any fixes or resolutions.

As described in Section 1.3, the Contractor shall support the Hooksett ORT construction and implementation project (Hooksett 15803). The Contractor shall enter into a separate subcontract agreement with the Hooksett ORT Construction Contractor, to install the necessary TCS equipment & software in two new NB & SB lanes (four lanes total) and to remove all the old equipment in the six center lanes at the Hooksett Toll Plaza. The Contractor shall be involved in design and coordination efforts with NHDOT, the Hooksett ORT Construction Contractor and the ORT Vendor (Telvent).

C-2.2. Interim Legacy TCS Maintenance Requirements

The Contractor shall maintain the legacy TCS at its current level of operation with no degradation in system performance. During the Interim Maintenance period, the Contractor shall only be subject to meeting all Interim Maintenance Coverage, Response and Repair Times requirement as specified in Section 2.2.3. Interim Maintenance Services shall be billed on a monthly basis, separately from the other phases of the contract.

Interim Maintenance shall include the following key levels of service activity:

- Preventive Maintenance (PrM)
- Corrective Maintenance (CrM)

C-2.2.1. Preventive Maintenance (PrM)

Preventive Maintenance (PrM) shall involve any and all required scheduled maintenance activity of the existing TCS and its components to ensure that the system is operating properly and within specified performance parameters. PrM is intended to provide

maintenance of the existing TCS on a routine basis in an effort to reduce failure or any degradation in performance or functionality.

As part of the Interim Maintenance Plan the Contractor shall identify each system component, subsystem or equipment that will undergo PrM and provide details on the proposed frequency of each maintenance activity.

C-2.2.2. Corrective Maintenance (CrM)

Corrective Maintenance (CrM) shall include any form of hardware maintenance activity that is required to be performed in response to a failure or degradation in existing TCS performance or functionality. CrM activities shall be initiated upon notification or observation of system or component failure. During CrM activities the Contractor shall be held accountable for meeting all Coverage, Response and Repair Times requirement as specified in Section 2.2.3.

In the event of repeated failure of TCS software, the Contractor shall attempt to determine if the issue is widespread throughout the TCS system. In such a case, the Contractor shall work with NHDOT in requesting support from TRMI to correct the software problem.

C-2.2.3. Coverage and Response Times

In fulfilling Interim Maintenance support the Contractor shall designate and schedule appropriate "On-Duty" technician or staff personnel. On-Duty staff may receive failure notifications or reports by telephone, email or text messages or verbal communications of any problems, events, unusual behaviors or problems with the TCS. Based on such notification the Contractor shall initiate and dispatch appropriate personnel to respond.

The Contractor may, but is not required to, utilize the existing TCS MOMS to perform Interim Maintenance. At a minimum, the Contractor shall generate and track both PrM and CrM work orders and share this information with NHDOT on a continuous basis.

The Contractor shall acknowledge and address all notifications in a manner that ensures proper verification and fully characterizes all relative information.

All notifications shall be documented by Contractor and reported monthly in a Problem Tracking Report that includes:

1) Date and time of notification;
2) Name and contact information for notifier;
3) Identification of Severity Level of issue;
4) Description of problem;
5) Description of resolution; and
6) Date and time of resolution.

At their discretion, the Contractor may use any current remote-access and diagnostic tools already in place, such as the existing MOMS to support first-line event reporting. Use of the network and access to all systems is subject to the terms and conditions of the DoIT "*Computer Access and Use Agreement*".

All reported issues or problems shall be classified as one of the following four event categories:

- **Mission Critical**: Defined as any malfunction or fault that will result in the immediate loss of revenue; closure of a lane; loss of audit data; or hazard to personnel or driving public.
- **High Priority**: Defined as any malfunction or fault that will degrade the TCS performance, but not the operational ability of the TCS.
- **Medium Priority**: Defined as any event that has potential of resulting in a malfunction or degrading of the TCS performance.
- **Low Priority**: Defined as any event or malfunction that is cosmetic and presents no risk in affecting TCS performance.

The following table defines the response time and repair time for each of the four (4) event categories:

Table 2-1 Response and Repair Times

Severity Level	Time to Respond	Time to Repair
Mission Critical	1 Hour	2 Hours
High Priority	4 Hours	8 Hours
Medium Priority	1 Business Day	8 Business Days
Low Priority	1 Business Day	14 Business Days

* Failure to meet Repair times due to NHDOT physical restrictions shall not be held against the Contractor. In the event a repair time is affected by such restriction it shall be recorded including the length of the delay.

**In the event the Contractor deems the repair to be catastrophic or requiring additional support from TRMI a request for waiver may be made.

Response and Repair times shall be calculated on a per event basis.

Response times shall be determined based on when the Contractor receives notification of an event, and the time the Contractor acknowledges said event.

Repair times shall be determined based on when the event is acknowledged and when it has been fully resolved.

C-2.2.4. Lane System Maintenance

The Contractor shall maintain and make repairs as needed to the following components of the legacy TCS Lane System. The Contractor shall be responsible for any specialized equipment or training that is required to perform repairs and maintenance on the following:

- *E-ZPass Automatic Vehicle Identification Readers and Antennas*
- *Automatic Vehicle Classification Subsystem or Components*
- *Violation Enforcement Cameras, Triggers and Lighting*
- *Lane Controllers*
- *Automatic Coin Machines*
- *Toll Terminals*
- *Receipt Printers*
- *Attendant Identification Displays*
- *NEMA Equipment Cabinets*
- *Canopy Traffic Lights*
- *Canopy Override Switches (including Canopy Traffic lights Interlock functionality for reversible lanes)*
- *Patron Fare Displays*
- *Island Traffic Lights*
- *Uninterrupted Power Supplies*

C-2.2.5. Plaza System Maintenance

Plaza system maintenance shall consist of maintaining computers, monitors, servers and network communications as well as the following components:

- *Plaza Workstations*
- *Printers*
- *Bar Code Readers*
- *Violation Enforcement System (VES) Server*
- *Uninterrupted Power Supplies*

C-2.2.6. TCS Host System Maintenance

The legacy TCS Host System is comprised a network of DELL or HP servers that interface between the plaza host servers and the CSC. The TCS Host System is located at the NHDOT Headquarters at the John O. Morton building in Concord NH. The Contractor shall provide, to the extent possible, hardware maintenance for the following TCS Host items:

- *Database Server*
- *Web Server*
- *Communications Server*
- *Redundant Data Storage*
- *Tape Backup*

The Contractor shall not be responsible for loading and maintaining consumables such as media, paper, toner & printer cartridges and magnetic tapes or solid state media drives ("USB or thumb drives"). Any removable media drives shall also be utilized in a secure fashion as to prevent unauthorized access.

C-2.2.7. LAN/WAN Communications System Maintenance

LAN/WAN Communications System Maintenance shall consist maintaining a copper/fiber network communications infrastructure including the following components:

- *Switches*
- *Fiber to Ethernet Converters*
- *Broadband Cable Internet (including a Host Router VPN Server and VPN Clients installed on Plaza Routers, also including coordination and troubleshooting with the NHDOT's ISP's)*
- *Modems and Routers*

C-2.3. Interim Maintenance Management and Administration

Phase I will commence immediately upon issuance of NTP with the Selected Contractor assuming all legacy system maintenance efforts on July 1, 2012, , the Contractor shall become immediately involved in Interim Maintenance by assigning a person(s) to meet with NHDOT, TRMI in order for the transfer of information to begin and flow smoothly.

C-2.3.1. Maintenance Staffing, Materials and Training

The Contractor is responsible for providing all personnel necessary to perform the Interim Maintenance Services required in Phase I of the RFP. The Contractor shall assume all expenses related to attracting and hiring all personnel. All personnel engaged in the

maintenance, repair and troubleshooting shall be qualified, properly licensed, OSHA safety trained and compliant under all applicable laws and regulations local, state and federal.

The State may conduct reference and background checks on all Maintenance Staff under this Agreement. The State reserves the right to reject any of the Contractor's assigned Staff as a result of such reference and background checks.

C-2.3.2. Asset Inventory

During the Interim Maintenance period, the Contractor shall assume responsibility for spare parts and asset inventory including tracking and purchasing of all asset inventory items. NHDOT shall deliver the current spares and assets in inventory to the Contractor but maintain ownership of the inventory. When spare parts inventory reach a critical level, the Contractor shall inform NHDOT to decide if the spares to be ordered will be needed for the New TCS or allow the supply to dwindle to zero for certain parts or components.

C-2.3.3. Interim Maintenance Plan

The Contractor shall provide an Interim Maintenance Plan no later than 30 days after NTP. The Interim Maintenance Plan shall detail both the transition efforts and maintenance procedures to be executed. The Interim Maintenance Plan shall include the following:

1. Maintenance Management & Personnel
2. Maintenance Methodology
3. Maintenance Procedures
4. Preventive, Predictive Emergency & Corrective Maintenance Procedures
5. Repair and Replacement Procedures
6. Lane Closings
7. Corrective Maintenance Priority Matrix
8. Service Call Procedures (Technicians)
9. Technician Responsibility- Notification & Acknowledgement
10. Call Escalation
11. Service Call Closure
    - Reporting Service Calls with Actual/Potential Loss of Data
12. Safety Procedures
13. Spare Parts and Inventory Control
14. Maintenance Reporting and Control
15. Preventive Maintenance (PrM) Schedule (an existing preventative maintenance schedule will be provided at NTP)
16. Maintenance Roster/Organization Chart

C-2.3.4. Maintenance Facilities

The Contractor shall utilize Maintenance Facilities provided by NHDOT for interim maintenance. Suitable facilities shall be provided at the following locations:

- Hampton Mainline
- Hooksett Mainline
- Merrimack (Exit 10) for storage

C-2.3.5. Maintenance Test Equipment Tools and Materials

The Contractor shall furnish all necessary equipment, test equipment, power tools, hand special calibration devices necessary to perform their duties under this Contract. Additionally the Contractor shall also provide necessary vehicles, including lift or bucket truck(s) for overhead work.

C-2.3.6. Reporting

The Contractor shall provide periodic reports on their interim TCS maintenance efforts to NHDOT. Reports shall be submitted on a monthly basis and be released prior to invoicing. NHDOT may request the Contractor to provide weekly reports or reports on an as needed basis depending upon the events or failures that may necessitate this frequency.

C-2.3.7. Coordination with NHDOT Staff and Toll Operations

The Contractor shall provide advance notice of lane closures to NHDOT when possible. The Contractor shall provide coordination with the NHDOT and any other contractor who will be actively performing work in the work area. Specific to lane and plaza work the Contractor shall also coordinate with and obtain the Supervisors approval.

C-2.4. Existing Software and Firmware Maintenance

The NHDOT will retain the services of TRMI on a time and materials basis for maintenance of existing legacy software and firmware. The Contractor shall coordinate with TRMI to support their software maintenance efforts during the Phase I Interim Maintenance period (July 1, 2012 through June 30, 2013).

C-3. PHASE II – TOLL COLLECTION SYSTEM UPGRADE REQUIREMENTS

C-3.1. Scope of Work

Phase II of the project shall involve the efforts needed to upgrade the legacy TCS with new software and hardware while reusing as much of the existing hardware for as long as possible to minimize cost. The intent of Phase II is to provide a new TCS with an expected life cycle of no less than 10 years which is both easy to maintain and cost effective to the NHDOT. The new TCS shall meet the following criteria:

a) The new TCS shall be developed from an existing and stable product base.

b) The new TCS shall support life cycle upgrades of new hardware types as existing lane hardware will be refreshed throughout the five (5) year term.

c) The new TCS shall be capable of integrating options for additional functionality such as Digital Video Audit System (DVAS)

d) The new TCS shall provide support for migration to future AVI Kapsch readers

e) The new TCS shall be capable of supporting future transponder protocols.

Phase II shall commence with NTP and be performed concurrently with the Phase I Interim Maintenance efforts. In Phase II the Contractor shall provide a seamless transition from the legacy system to the new TCS.

C-3.2. System Overview

As the new TCS is primarily an upgrade from the legacy system, the overall system architecture is expected to remain the same. The Contractor is however urged to propose any new system design modifications that may introduce efficiencies in operations and or positive impacts to both initial system costs as well as ongoing maintenance during Phase III.

With the above in mind, it is the intent that the new TCS system architecture would continue to follow the three-level approach which comprises a lane level, plaza level and Host level.

The NHDOT TCS Host will continue to communicate directly with both the E-ZPass CSC/VPC and the ORT Host as per the Interface Control Documents provided as exhibits to this RFP. As described above the ORT Host will continue to pass transactions through the NHDOT TCS Host to be forwarded to the CSC/VPC for processing.

C-3.3. Deliverable Payment Schedule

In Phase II, the Contractor will be compensated for work satisfactorily performed under the Contract, based on the Payment Schedule detailed below. All invoices will be subject to 5% retainage to be paid upon Final System Acceptance. Interim Maintenance services shall be billed separately on a monthly basis and as such excluded from the Phase II Deliverable Payment Schedule.

Table 3-1 Payment Schedule

Event /Deliverable /Milestone	Percent Payment*	Cumulative Gross Payment	Payment Minus Retainage	Cumulative Net Payment
Notice to Proceed/Mobilization	5.0%	5.0%	4.75%	4.8%
Project Management Plan	3.0%	8.0%	2.85%	7.6%
Approved Baseline Project Schedule	2.0%	10.0%	1.90%	9.5%
Interim Maintenance Plan	4.0%	14.0%	3.80%	13.3%
Preliminary Design Review Meeting & System Requirements Matrix	4.0%	18.0%	3.80%	17.1%
Approved Master Test Plan	5.0%	23.0%	4.75%	21.9%
Approved Draft Business Rules Document	2.0%	25.0%	1.90%	23.8%
Approved Draft Interface Control Documents	2.0%	27.0%	1.90%	25.7%
Approved Draft Detailed Design Document	4.0%	31.0%	3.80%	29.5%
Approved Final Business Rule Document	2.0%	33.0%	1.90%	31.4%
Approved Final Interface Control Documents	1.0%	34.0%	0.95%	32.3%
Approved Final Detailed Design Document	4.0%	38.0%	3.80%	36.1%
Successful Completion of Factory Acceptance Test and Report (**Phase IIA Complete**)	10.0%	48.0%	9.50%	45.6%
Approved Installation, Transition Plan and Data Migration	5.0%	53.0%	4.75%	50.4%

 Vendor Initials_____

Date_____

Training	5.0%	58.0%	4.75%	55.1%
Final Shop Drawings	2.0%	60.0%	1.90%	57.0%
Successful Completion of OFIT, System Acceptance Testing and Commissioning	10.0%	70.0%	9.50%	66.5%
Final Maintenance Plan	2.0%	72.0%	1.90%	68.4%
Approved TCS Maintenance and Service Manual	2.0%	74.0%	1.90%	70.3%
Successful Completion of Installation and Commissioning and Issuance of Provisional Final System Acceptance (**Phase IIB Complete**)	5.0%	79.0%	4.75%	75.1%
Approved Manuals: - Toll Collector - Toll Supervisor - Administrator/Audit User -Maintenance Manual	5.0%	84.0%	4.75%	79.8%
Successful Completion of EOT (**Phase IIC Complete**)	10.0%	94.0%	9.50%	89.3%
Final Parts List and BOM	2.0%	96.0%	1.90%	91.2%
Approved As-Built Drawings	2.0%	98.0%	1.90%	93.1%
Software Escrow approved	2.0%	100.0%	1.90%	95.0%
Retainage*	5.0%		5.0%	100%

*Retainage Released after all final items (Final Parts List, BOM, Approved As-Built Drawings and Software Escrow) are delivered and all punch list issues are closed.

C-3.4. Compliance Matrix

Form 6 in Appendix I provides the overall contract compliance matrix for the Proposer's response to this document.

C-3.5. Use of Existing Equipment

The Contractor shall make every effort to use the existing lane hardware to the fullest extent possible. NHDOT has continually upgraded this hardware and several components as recently as May 2011. The Contractor is expected to examine existing TCS hardware during the Pre-Proposal and Jobsite Inspection that may have potential for re-use as part of the new TCS.

As a preliminary effort the NHDOT has identified the following devices that may be suitable for re-use.

a) Lane Level:
   - E-ZPass Automatic Vehicle Identification (Kapsch/Mark IV readers, RF modules and antennas, cables, mounting brackets and reader cabinet)
   - Automatic Vehicle Classification (loop detectors, contact treadles, overhead laser scanners)
   - Lane Controllers (computers, boards, serial I/O)
   - Automatic Coin Machines (coin sorters, coin paths, dual and triple vault systems, portable bar code readers)
   - Toll Terminals (touch screens and mounting arms)
   - Receipt Printers
   - Attendant Identification Displays
   - NEMA Equipment Cabinets
   - Canopy Traffic Lights
   - Canopy Override Switches (including Canopy Traffic lights Interlock functionality for reversible lanes)
   - Patron Fare Displays
   - Island Traffic Lights

b) Plaza Level:
   - Plaza Workstations
   - Printers
   - Bar Code Readers (for money bag tracking)

Table 3-2 below provides NHDOT's expected replacement cycle for the various TCS components over the next five (5) years. The Contractor shall take these replacement cycles into consideration in the development of the Proposal and subsequent completion of the Price Sheets in Appendix I. It is however expected, and encouraged, that the Contractor will provide an approach to replacement of the equipment that is efficient and cost effective and the proposed replacement cycle in the table below is only suggestive based on internal NHDOT estimates.

Table 3-2 TCS Equipment Life Cycle

NHDOT – Toll Collection System – Equipment Life Cycle Table

Part Name	QTY	Year 1	Year 2	Year 3	Year 4	Year 5	Life Cycle
Automatic Vehicle Identification							
Kapsch JANUS Reader & Connectivity	19	3			8	8	12 years
Kapsch JANUS Standard Lane Kit	83				53	30	12 years
Kapsch JANUS Over Dimensional Lane Kit	8				8		12 years
AVDC System							
Overhead Laser Scanner	91	91					10 years
Booth Equipment							
Toll Collector Touch Screen Terminal	91		24	24			4-8 years
Patron Fare Display (PFD)	84				42	42	6-8 years
Receipt Printer	85	12	12	12	12		5-7 years
Toll Lane & Host IT Equipment							
Lane Controller	91					91	7 years
Toll Host Server & Redundant Server	2	2					5 years
Plaza Workstation							5-7 years
Violation Enforcement System							
VES Plaza Server	10	10					5 years
VES Cameras & Lighting Per Lane	77	36		41			4-7 years
VES Host System Server	1	1					5 years
Other							
Full Plaza UPS	10			10			4-6 years

The Contractor shall provide an approach to replacement of the equipment that is efficient. The Contractor shall identify any of the above items that they determine may affect performance and the Contractor must clearly identify the reason for replacement in the proposal. NHDOT may elect to proceed with degraded performance and push out replacement to future years. Likewise the Contractor shall provide a brief explanation why a component or system can remain in operation for a longer period than the proposed replacement cycle.

Should the Contractor encounter a hardware item, system component, software or any necessary work that is outside the scope of this RFP, NHDOT shall resolve this contingency through a work order.

The re-use of any existing equipment shall be subject to the performance requirements set forth in Appendix I.

The Contractor shall include in their proposal, a phased schedule for replacing the re-used equipment over the life of the contract. The Contractor shall also include a cost estimate for the equipment to be replaced, detailed by labor and material costs.

The Contractor shall replace the current Violation Enforcement System (VES) with new hardware and software. The current VES cameras are not to be considered for re-use. However, the existing camera housing, illumination and plaza-based VES servers may be reused. The new VES requirements are specified in Section C-3.6.9.

C-3.6. Lane Level Requirements

The following sections are intended to provide a description of the requirement for each of the various lane types and lane operating modes, from both a functional and technical perspective.

 Vendor Initials_____

Date_____

C-3.6.1. Lane Modes

The new toll collection system shall support the following lane operating modes:

LANE TYPE	LANE OPERATING MODE	PAYMENT METHOD
Manual/AVI	Manual/E-ZPass	Cash or E-ZPass
Manual/AVI	E-ZPass Only	E-ZPass Only
Manual/AVI	Maintenance	Cash or E-ZPass
Manual/AVI	Closed	None
Manual/AVI	Special Events	Cash or E-ZPass
Manual/AVI	Convoy	Cash or E-ZPass
Manual/AVI/ACM	Manual/E-ZPass	Cash or E-ZPass
Manual/AVI/ACM	E-ZPass Only	E-ZPass Only
Manual/AVI/ACM	E-ZPass/ACM	E-ZPass or Exact Change
Manual/AVI/ACM	ACM Only	Exact Change
Manual/AVI/ACM	Maintenance	Cash or E-ZPass
Manual/AVI/ACM	Closed	None
Manual/AVI/ACM	Special Events	Cash or E-ZPass
ACM Only	ACM Only	Exact Change
ACM Only	Maintenance	Exact Change
ACM Only	Closed	None
ACM Only	Special Events	Cash or E-ZPass

a) Special Events Mode -The Special Events functionality accommodates NHDOT's need to let vehicles go through the toll lanes for free during emergency situations such as serious accident. Tolls will not be collected from any patron in this mode. The canopy light and the traffic light remains steady green. The PFD remains blank to avoid patrons slowing down. The AVDC system will classify each vehicle and will set the Method of Payment (MOP) to be Exempt, with a reason code called Special Event. The AVI will be active but no transactions shall be sent to the CSC and all traffic and class of vehicle shall be reportable. A Special Events mode can occur in all lanes.

b) Maintenance Mode - This mode shall provide the opportunity to close the lane with full functionality for maintenance operations. Personnel will be able to run diagnostics, make repairs, testing and other maintenance activities that will create E-ZPass, cash or other transactions but will not be passed on to the CSC/VPC or included in traffic count data. The canopy light remains red.

c) Convoy Mode – The Convoy Mode functionality allows NHDOT to process a series of non-revenue vehicles as a convoy. If convoy operations are selected the following shall occur:

- The canopy traffic light shall be green while the traffic light remains green;
- The toll supervisor shall be notified through the Host on the Supervisor Workstation
- All transactions shall be recorded and a corresponding indicator shall appear in the transaction record for each vehicle passage during these modes;
- For any vehicle that is part of the procession and equipped with a transponder shall not be assessed a toll; and
- The AVDC class and the ETC class if available is included in the transaction.

C-3.6.2. Lane Functionality

Manual/E-ZPass Lane

In manual/E-ZPass lane mode, all vehicles are processed either manually by a toll attendant or automatically by the E-ZPass subsystem. For cash payments (manual mode only) the toll attendant processes vehicles into a toll terminal as follows:

1. determining and entering the vehicle classification.
2. determining and entering method of payment.
3. receiving payment (cash or non-revenue) from the motorist.
4. making change and providing a receipt. The collection shall also have the ability to produce a print out from the receipt printer with up to 5 pre-defined messages such as directions.
5. making a sale of merchandise.
6. handling exceptions

In this mode:

- The attendant shall have the ability to cancel and correct an incorrect classification during a manual transaction, which results in coding the transaction as an unusual occurrence (UO).
- The attendant shall have the ability to cancel an incorrect MOP (cash or E-ZPass) which results in coding the transaction as an UO.
- The attendant shall have the ability to may cancel both incorrect classification and incorrect MOP, which results in coding the transaction as an UO.
- The attendant may manually end a transaction with the End Trx button which results in coding the transaction as an UO.

- If the driver requires a cash receipt, the attendant will push the Receipt button on the toll terminal.
- The VES cameras will not capture license plate images when a lane is operating in manual/E-ZPass mode. However the TCS shall be designed to accommodate image capture while in manual mode for future use.
- The attendant cannot classify E-ZPass transactions. The classification is internal to the tag.
- If an attempt is made to indicate a class for an AVI paying vehicle, the attendant-indicated class will be ignored by the system.
- The attendant may cancel an incorrect MOP or E-ZPass transaction for a vehicle that has a valid E-ZPass tag and accept cash as payment. This will be recorded as an unusual occurrence.

All transactions entered into the toll terminal are captured as electronic data by the lane controller collocated in the toll lane. This data is transferred to the TCS Host. Toll terminal transactions are processed in the audit system to determine toll attendant job performance.

Each lane has a two contact treadle in the roadway, which records the number of axles as a vehicle passes over it. The treadle provides axle counts that are captured by the lane controller and form an element of the attendant's audit. The number of axles calculated from attendant vehicle classifications is compared in the audit system to actual treadle axles.

The toll attendant collects currency and coins into a cash drawer. At the end of their tour of duty (TOD), attendants currently pass the total collections to the Supervisor.

ACM Lane

ACM lanes are restricted to Class 1 vehicles with exact change (coins). In an ACM lane, the motorist deposits the fare into a coin basket. The coin basket delivers the coins to the automatic coin machine (ACM), which authenticates and counts the coins, then verifies against the toll rate. If the motorist deposits a correct fare, after verification, the traffic signal turns from red to green and the vehicle is allowed to exit the lane. The exiting vehicle is detected by the AVDC system, which sends a vehicle count to the ACM. The loop resets the ACM and the traffic signal to red so that the following vehicle may be processed. A lane controller captures data from the ACM. This data shall be processed in the audit system where the vehicle class, expected payment and or underpayment are tracked.

The ACM delivers all coins to a single or triple vault system which is generally located in a tunnel beneath the lane. Only one vault is active at one time. The active vault secures all coins until a new vault is selected. Vault selection may be controlled by the system after processing a predetermined number of coins or be manually selected/deselected by the staff.

Note: At the Dover and Rochester plazas the vault is located in each booth.

Dedicated E-ZPass Lane

In the dedicated E-ZPass mode, the lane will be assigned a virtual attendant ID used for the Tour of Duty (TOD's) generated in the lane. The virtual attendant ID is based on the lane number and plaza identification. The ID of the attendant or Supervisor who logs in will be used for each SOD associated with that TOD and for all the transactions. VES cameras will capture all front and rear license plate images when the lane is operating in dedicated E-ZPass mode.

C-3.6.3. Data Exchange

The lane controller shall periodically receive data files and information updates from the NHDOT TCS Host per applicable administrative rules for items including Canadian exchange rates, attendant ID tables, E-ZPass transponder status files, time stamp, and toll rate schedules. The lane shall periodically send data and information updates to the NHDOT TCS Host for items including transaction files, in-lane events, peripheral device status changes, and in-lane equipment diagnostic messages. The lane shall be able to receive and act upon the commands that are sent remotely from the toll supervisor workstations. These commands include opening and closing a lane remotely, changing lane modes, and resetting an improperly functioning lane.

Messages and file transfers shall use a TCP is optimized for accurate delivery rather than timely delivery. Proposers shall identify how message transmission between components is guaranteed in their systems. Contractors shall propose appropriate protocols and data structures to accomplish the communications required in this section, which shall be compatible with their existing products wherever appropriate. These protocols must be fully detailed by the Contractor and approved by the Project manager before system implementation. The Contractor shall propose appropriate status and diagnostic messages for review and approval by the Project Manager.

C-3.6.4. E-ZPass Database

The E-ZPass database file, maintains up-to-date account status information for all E-ZPass transponders (tags). The database shall contain information for all tags activated within the Inter Agency Group toll road system with expansion for at least 100 million transponders. The file, typically referred to as the tag status file, is received by the CSC host system via the IAG communications interface. The TCS shall send updates of this file to the

lane controller and the AVI reader when received by the CSC as based on TCS design. The following information shall be held in the database for each transponder:

d) The transponder number
e) The account status. This shall have one of the following values:
    - subscriber's account balance is above a defined low-balance threshold, valid (1);
    - subscriber's account balance has reached the defined low-balance threshold, low- balance (2);
    - subscriber's account has zero or negative balance, invalid (3);
    - transponder has been identified as lost or stolen, (4);
    - account has been provided to a non-revenue qualified NHDOT, non-revenue (5); and
    - provision for two (2) additional statuses, to be defined if required in future by NHDOT.

C-3.6.5. Transaction Processing

All toll lane system inputs shall be compiled to form a transaction record for each vehicle passing through the lane and for other relevant lane events. Final details about how each type of transaction and lane event is compiled for transmission to the TCS Host shall be developed by the Contractor and submitted for review and approval by NHDOT.

C-3.6.6. Speed Detection

Each toll transaction shall have a vehicle speed appended to it. Currently the speed is measured using the Autosense II overhead laser scanner unit. The Contractor may continue to use the Autosense II or choose a technology and method to measure the speed of all vehicles in the toll lanes.

The purpose of measuring speed is to assure the safe operation of vehicles traveling through the toll lanes, administratively enforce people exceeding a predetermined "safe speed", and provide statistically significant data on the speeds of vehicles traveling through the toll lanes. The safe speed must be easily configurable. It shall be possible to set different safe speeds for each of the ten NHDOT toll plazas. Any vehicle exceeding the safe speed shall be identified appropriately in the toll transaction file. The accuracy and reliability of speed detection shall meet or exceed industry standards.

C-3.6.7. Violation Detection

The system shall detect all the violation events that occur in the toll lane. Violation events will be defined during the detailed design review stage. The existing violation logic is described in Section 3.4.9.2. Events include, but are not limited to, run-through vehicles with no transponder, run-through vehicles with an invalid transponder (Type 1 Violation), class mismatches and speeding (Type 2 Violation). Any violation event detected by the system shall be immediately reported on the Supervisor monitor with all pertinent data

included. The system design shall provide for superimposing this pertinent transaction data on captured images from the VES. VES images are only currently captured in lanes that operated in Dedicated E-ZPass mode.

C-3.6.8. Reverse Lane Mode Lock

Where there are reversible lane configurations, the Contractor shall design the system with a Reversible Lane Lock. Under this case the System shall only allow for the operation of a reversible lane in any one direction at a time. The lock functionality shall apply to all lane peripherals, components, etc. with particular attention to the overhead Canopy Light.

C-3.6.9. Automatic Vehicle Identification (AVI) System

The Contractor shall provide an AVI system that is certified to be compliant with the IAG requirements, including Kapsch tuning and commissioning of the AVI equipment. The AVI system shall be able to read E-ZPass transponders with the accuracy specified in Section C-3.18.1.

The Contractor shall be responsible for the placement, installation, physical tuning of the equipment, integrating the AVI system into the TCS Design, and maintenance. The Contractor shall furnish and install other cabling and associated equipment mounting fixtures necessary to form a fully functioning AVI system that meets the requirements of this RFP.

The AVI system shall be able to read and report E-ZPass Transponders on vehicles traveling through any area of the toll lanes with no degradation of performance or interference. If more than one Transponder is present in a vehicle, the AVI system shall have the ability to accurately read and maintain a database of multiple Transponders that are compliant with the IAG Interoperability requirements. The AVI system shall have the ability to process Transponders mounted on vehicles traveling in stop and go and bumper-to-bumper traffic in a fully congested roadway (three feet spacing) and on vehicles traveling at speeds up to 50 mph.

The AVI system shall be capable of continuously performing diagnostics and reporting its health to the toll lane controller. Loss of communication to any element of the AVI system shall be immediately detected and transmitted to the MOMS.

To support remote access to the AVI system, an interface shall be provided so that software lane tuning, diagnostics, and other remote support shall be available to authorized personnel. Setup and configuration of the AVI system shall be achieved remotely and shall not require lane closure except for major lane tuning; when initially installed or when a reader or antenna is replaced.

Note as part of the AVI system, the Agency currently utilizes functionality available in the IAG transponder to specifically designate non-revenue tags within the Agency's home

transponder pool. The agency also wants the ability to operate a multi-protocol reader in the future.

Working with NHDOT and the existing ORT Vendor, the Contractor shall:

- During implementation, installation, testing, operations, and maintenance of the System, the Contractor is responsible to ensure that the Cash/E-ZPass Lanes does not interfere with the operation of the ORT lane system.
- Evaluate the ORT lane readers and recommend settings to ensure that the Cash/E-ZPass lanes operate properly and do not interfere with ORT lane operations.
- Be responsible for analyzing, evaluating, designing and making recommendations for any required upgrades and modifications to existing Cash/E-ZPass lane antennas and readers such that future ORT and Cash/E-ZPass Lane systems interoperate properly.
- Coordinate with the existing ORT Vendor for the connection to the existing (and future) ORT AVI Systems.

Working with the selected Contractor and the existing ORT Vendor, the NHDOT will:

- Facilitate technical and schedule coordination between the Contractor and the existing ORT Vendor.
- At NHDOT's expense and if necessary, upgrade the existing Cash/E-ZPass lane readers to be compatible with future ORT Lane readers.

C-3.6.10. Automatic Vehicle Detection and Classification (AVDC) System

The Contractor shall be responsible for installing and maintaining the required sensors and hardware as part of the AVDC system that shall accurately detect, separate, and classify vehicles traveling in stop and go ("bumper-to-bumper") traffic in a fully congested roadway and vehicles traveling at speeds up to 50 mph, and accurately separate vehicles spaced as closely as three (3) feet apart, with Proposer's offering a solution that exceeds this requirement receiving more favorable consideration technically. The system shall also be able to recover from instances of vehicles backing up through the lanes and this activity shall not impact the classification and detection of other vehicles in the lanes. The AVDC system shall detect the speed of the vehicle and report that to the toll lane controller as part of the vehicle transaction data.

The AVDC system developed, procured, furnished, and installed shall have the ability to detect hitches and ensure that vehicles towing trailers are reported as one unit and are classified according to current Agency toll rates and classification structures. The

Contractor shall analyze the site conditions and procure, furnish and install the sensors that perform in accordance with performance requirements set forth in this document.

The AVDC system shall provide vehicle event messages and signals, and classification data to the toll lane controller and VES trigger. The AVDC system shall be capable of reporting its health to the lane controller and shall provide status when polled. Loss of communication to any element of the AVDC system shall be immediately detected and transmitted to the TCS Host to be reported to the MOMS. The AVDC system shall have adequate redundancy whereby a failure of a single sensor does not degrade lane operations or the System's capability to accurately capture and process images. In the event the AVDC system fails, images of all vehicles shall be captured and processed in accordance with Agency Business Rules.

In the event there is a classification mismatch between the AVDC system and the Transponder, as defined by the Agency Business Rules, the system shall be capable of capturing an image of the vehicle and processing in accordance with the Business Rules. The current system does not save these images so after testing the functionality would be disabled.

In addition to detecting the axle configurations necessary to support the current toll rate structure, the AVDC shall also include the functionality to utilize the height of vehicle for either augmenting the current classification structure or as a basis for potential future classification structures.

The Systems shall detect and report the actual height of each vehicle that passes through all lanes.

C-3.6.11. Violation Enforcement Subsystem

Existing VES Subsystem

The existing Violation Enforcement Subsystem (VES) provides coverage in the twenty-six (26) dedicated E-ZPass lanes spread across the various toll plazas. The system consists of two cameras per lane (front and rear license plate capture) paired with two image capture cards installed in each lane controller. The VES captures an image from both front and rear cameras in response to a trigger from the AVDC subsystem. The VES images are processed in the lane and associated with the transaction information from the lane controller. The images are sent to a VES server at the plaza for storage where they can be manually reviewed using a VES software application. The violation images are then pushed to the CSC/VPC for further processing

Images are captured in lanes that only run in Dedicated E-ZPass mode. Images are only currently to be captured for Type 1 violations (toll violations). No images are captured for Type 2 violations (class mismatch or speeding) or for lanes running in E-ZPass/Manual mode

or ACM Only mode. When the lane system that operates in Dedicated E-ZPass mode detects a Type 1 violation event, the VES system captures the front and rear images of the violating vehicle and the corresponding ticket number and save the captured violation record to the plaza VES server. The VES plaza server sends violation images to the CSC/VPC. The host system sends all the transactions associated with the violations to the CSC/VPC.

The supervisor workstation is available for use by the toll supervisor to view new and saved Type 1 violation images and their corresponding transaction messages. The workstation also provides a monitoring tool for the VES system maintenance staff. At the plaza, the supervisor is able to view the images and the transaction data of the toll violation event. The images and data are displayed on the monitor until it is replaced by the next event. The supervisor also has the ability to view a previous violation image; providing the violation has occurred at the plaza within the past seven days.

Violation Logic

The TCS system will process three types of violations, type 1 violations, type 2 violations and type 3 violations. Each violation type would result in a violation event that would be processed by the lane system at each of the five lane operational categories, which are: Dedicated E-ZPass, E-ZPass Manual, ACM Only, Closed Lane, and Special Events and Convoy modes. The violation matrix presented below identifies the Violation Logic for these five operational categories.

Table 3-3 Violation Logic

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
Type 1: Toll Violation in the Dedicated E-ZPass lane	A vehicle without a tag in the Dedicated E-ZPass lane	Yes	Yes	No	Type 1 E-ZPass transaction records file (V) from Host to VPC (once a day) Violation Image record file from Plaza	The violator could be either a true toll violator or an E-ZPass patron who travels without a tag or with a defective tag

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
					to VPC (as occurred)	PDF displays "Call E-ZPass"
Type 1: Toll Violation in the Dedicated E-ZPass lane	A vehicle with an invalid tag in the Dedicated E-ZPass lane	Yes	Yes	Yes	Type 1 E-ZPass transaction records file (V) from Host to VPC (once a day) Violation Image record file from Plaza to VPC (as occurred)	CSC is expected to wait 5 days before processing the Violation Images for NH E-ZPass accounts (to accommodate patrons who deposit funds into their account a short time after that violation) PFD displays "Call E-ZPass"
Type 1: Toll Violation in the Dedicated E-ZPass lane	Vehicle with lost/stolen tag in the Dedicated E-ZPass lane	Yes	Yes	Yes	Type 1 E-ZPass transaction records file from Host to VPC (once a day) Violation Image record file from Plaza to VPC (as occurred)	PFD displays "Call E-ZPass"

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
Type 1: Toll Violation in the manual lane	Vehicle with an invalid tag at the E-ZPass/Manual lane	No	Yes	Yes	Type 1 E-ZPass transaction records file (V) from Host to VPC (once a day)	The event will be identified as a toll violation. Such a toll violation event will be displayed on the plaza monitor screen and also be recorded in the Plaza Events report and the SOD/TOD report. This is considered a tag violation on the CSC side
Type 1: Toll Violation in the manual lane	Vehicle with lost/stolen tag in the E-ZPass/Manual lane	No	Yes	Yes	Type 1 E-ZPass transaction records file from Host to VPC (once a day)	The event will be identified as a toll violation. Such a toll violation event will be displayed on the plaza monitor screen and also be recorded in the Plaza Events report and the SOD/TOD report. This will not be

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
						processed in the CSC because we don't have an image.
Type 1 Violation in the manual lane.	Vehicle with no cash payment	No	Yes	Yes	No E-ZPass transaction record or image generated.	No E-ZPass transaction record or image generated.
Type 2: Speed violation in the Dedicated E-ZPass lane	Vehicle with a valid tag travels at excessive speed in the Dedicated E-ZPass lane	No	No	Yes	E-ZPass transaction records file for type 2 violations from Host to CSC (once a day)	CSC will process this kind of type 2 violation (speeding) in accordance with pre-defined business rules
Type 2: Class mismatch violation in the Dedicated E-ZPass lane; AVI > AVDC	Vehicle with a valid tag uses a vehicle whose class is higher than the AVDC derived class in the Dedicated E-ZPass lane	No	No	Yes	E-ZPass transaction records file (C) for type 2 violations from Host to CSC (once a day)	The CSC processes it as a normal transaction for the appropriate AVI fare in accordance with pre-defined business rules
Type 2: Class mismatch violation in the Dedicated	A vehicle with a valid tag uses a vehicle whose class is lower than the AVDC	No	No	Yes	E-ZPass transaction records file (C) for type 2 violations from Host to CSC (once a	CSC processes this violation as a type 2 (class mismatch) violation in accordance

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
E-ZPass lane; AVI < AVDC	derived class in the Dedicated E-ZPass lane				day)	with pre-defined business rules
Speed violation in the manual lane	A vehicle with a valid tag travels at excessive speed in the E-ZPass/Manual lane	No	No	No	E-ZPass transaction records file for type 2 violations from Host to CSC (once a day)	E-ZPass manual lane does not declare speed violation for ETC transaction conducted by E-ZPass patrons as per NHDOT E-ZPass business rules. The transaction record, which is identified as a Normal, transaction, does contain the vehicle speed information. In accordance with NHDOT E-ZPass business rules.

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
Type 2: Class mismatch violation in the manual lane; AVI > AVDC	A vehicle with a valid tag uses a vehicle whose class is higher than the AVDC derived class in the E-ZPass/Manual lane	No	No	No	E-ZPass "Normal" transaction records file from Host to CSC (once a day)	"Normal" E-ZPass transaction record is created for the CSC. The CSC processes this transaction for the AVI fare in accordance with pre-defined business rules
Type 2: Class mismatch violation in the manual lane; AVI < AVDC	A vehicle with a valid tag uses a vehicle whose class is lower than the AVDC derived class in the E-ZPass/Manual lane	No	No	No	E-ZPass "Normal" transaction records file from Host to CSC (once a day)	"Normal" E-ZPass transaction record is created for the CSC. The CSC is expected to process this record as a normal transaction for the appropriate fare plus undefined incremental tolls
Type 3: Toll violation in the manual lane	A vehicle without a tag and with no payment in the E-ZPass/Man	No	Yes	No	None	Event will be displayed on the plaza monitor screen and also be recorded in

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
	ual lane					the Plaza Events report as a message and in the SOD/TOD report This violation is not recorded as a transaction
Type 3: Class mismatch attendant vs. AVDC, in the manual lane	Vehicle with full cash payment (not tag), and the vehicle class mismatches the attendant's entered class at the E-ZPass Manual lane	No	No	No	None	Event will be displayed on the plaza monitor screen and also be recorded in the Plaza Events report and in the SOD/TOD report
Type 3: Toll violation in the ACM lane (underpayment)	Vehicle without full toll payment at the ACM lane	No	Yes	No	None	Event will be displayed on the plaza monitor screen and also be recorded in the Plaza Events report and in the SOD/TOD report

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
Type 3: Class mismatch in the ACM lane	A vehicle with full payment in the ACM lane, but its class is higher than class 1	No	Yes	No	None	Such a class mismatch event will be displayed on the plaza monitor screen and also be recorded in the Plaza Events report and in the SOD/TOD report
Type 3: Closed lane violation	A vehicle that drives through a closed lane (it would not make a difference if the vehicle is equipped with valid tag or if the driver pays the toll at the ACM basket, it is still a violation)	No	Yes	No	None	This transaction will be processed as a toll violation event. This kind of toll violation event will be displayed at the plaza monitor screen and also be recorded in the Plaza Events report and on the SOD/TOD report for the Closed Lane Since a Closed Lane sets the AVI

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
						reader to Guard mode, the reader will not read tag data from vehicles equipped with a valid ETC tags that travel through the closed lane
Type 3: Vehicle travels at any lane type during Special Events	A vehicle that drives through a lane in Special Events Mode	No	No	No	None	All vehicles that travels through a lane without a payment during Special Event mode is not considered to be toll violators. The transaction will be coded as an Exempt transaction with an Exempt code #99, Special Events
Type 3: NR Convoy vehicle in a manual lane	A vehicle that drives through a manual lane in NR Convoy Mode	No	No	No	None	A vehicle that travels through a lane without a payment while being associated with NR convoy is not

Violation Type	Violation Event	VES Image Captured?	Lane Violation Alarms Energized ?	ETC Transaction Contains Type 2 Violation Data?	Type of Data Sent from the TCS to the CSC/VPC for Violation Processing	Comments
						considered being a toll violator. The transaction will be coded as an Exempt transaction with an Exempt code #99

Future VES Subsystem

The Contractor shall furnish and install all necessary VES hardware and software required to support the violations processing requirements set forth in this document. The Contractor shall provide VES equipment and software to support proper front and rear license plate image capture in all weather conditions. Vehicle license plate images shall be captured, processed, stored and transferred in accordance with the Business Rules to be developed during the Design phase and in accordance with all applicable violation legislation, the requirements of the CSC/VPC, and the business rules of the NHDOT. The proposed VES subsystem shall conform to the interface standards of the existing system. The Contractor may propose an alternate solution, at no additional cost to NHDOT, provided that the existing CSC Vendor agrees to support this alternate solution.

Vehicle license plate images shall be captured and processed in accordance with the NHDOT Business Rules to be reviewed during the Design phase and in accordance with all applicable New Hampshire violation legislation.

The VES shall capture and process vehicles traveling through the toll lanes as follows:

- Stop and go traffic
- "Bumper-to-bumper" traffic
- Vehicles traveling at speeds up to 50 mph
- Vehicles with separation as close as three (3) feet apart
- Vehicles positioned at the extreme edges of the lane

The VES shall be capable of buffering images (retaining an image until its disposition is known) such that no image is lost in order to support multiple vehicles in the lane and NHDOT Business Rules.

The Contractor shall furnish, and install cameras, lighting, necessary VES triggers, and the necessary camera control software to automatically adjust VES to accommodate varying light and weather conditions to maintain adequate brightness and contrast settings, with or without traffic, to ensure optimum license plate information capture under all conditions and time of day. Lights furnished and installed in support of VES cameras shall not distract motorists traveling in either direction in the lanes nor pose a nuisance to the surrounding communities.

The VES System shall be capable of capturing, processing, storing and transferring full images, the ROI or both as determined during the Design phase and in accordance with all applicable violation legislation, the requirements of the CSC/VPC, and the business rules of the NHDOT. Cameras shall be adjusted such that no images of the driver shall be taken.

Note that the current design of the NHDOT TCS includes image tagging for matching up to transactions at the CSC/VPC as described in the ICD in Appendix I.

The Contractor shall provide the necessary controllers/servers to support the in-lane VES equipment and functionality. The processor speed and memory shall be sufficient to process vehicles in real time to meet the speed and traffic volumes as specified in this document. The processor shall support standalone operations and the storage media shall be sized to hold a minimum of thirty (30) days of images and associated transaction data per lane at each of the tolling locations under normal operating conditions.

The VES shall be capable of performing with no degradation under conditions where every vehicle can be considered a violation (100% violations). Under these conditions the System shall be capable of storing images for seven (7) consecutive days per lane. The System shall be configurable to be set for processing of 100% violations. The VES controllers/servers shall have sufficient redundancy such that failure of a processor, board, power supply, disk or other critical unit does not result in loss of violation images and/or data. In the event communications to the VES controller/server is lost or the VES controller/server becomes non-operational, the Contractor design shall ensure that no images are lost. The VES shall be capable of continuously performing diagnostics and reporting its health to the MOMS. Loss of communication to any element of the VES shall be immediately detected and reported to the MOMS.

C-3.6.11.1.1. VES Implementation

The initial VES system implementation shall be designed, sized and installed to replace the existing 36 VES lanes and have the future capacity to be added to the remaining 48 lanes. NHDOT requests that the Contractor provide separate pricing for expanded VES coverage for the remaining 48 lanes of the conventional toll system. The new VES solution shall be priced in the cost proposal as detailed unit pricing by lane, component, hardware, software, installation and any required civil work.

The Contractor may re-use the existing VES servers which were recently upgraded in 2009. The Contractor may re-use certain VES equipment such as the illuminator and camera housings at their discretion.

C-3.6.11.1.2. OCR - License Place Procesing Functionality (Option)

The Contractor shall include Optical Character Recognition (OCR) functionality as an option to the VES. VES OCR functionality shall process image-based transactions captured from the lane and return license plate character information and confidence level parameter to the lane controller to be processed by the TCS host.

OCR determined U.S. plate jurisdiction (if assigned at the lane level and if applicable). OCR determined U.S. plate type (if assigned at the lane level and if applicable). OCR determined confidence level (if assigned at the lane level and if applicable).

The OCR engine shall return a correct result for 90% of the human readable license plate images captured by the System, including plate type and jurisdiction.

The VES OCR engine shall process all vehicle images through one (1) or multiple OCR engines.

The OCR engine shall produce plate number, plate type, and jurisdiction of issue for the license plate images when an OCR value is returned.

The System shall immediately flag Transactions for human review when the OCR values for the front and rear plate of a 2-axle vehicle do not match.

The System shall append the OCR value for the front plate to the Transaction when the OCR values for the front and rear plate do not match for vehicles with 3 or more axles.

C-3.6.12. Lane Technical Requirements

Lane Controller

It is the intention of NHDOT that the current lane controllers be reused to the greatest extent possible as the lane controllers were recently upgraded in 2010. Currently the lane controllers are installed in the plaza tunnels under each corresponding lane. Each lane controller cabinet is supplied with conditioned UPS power.

The specifications for the current lane controllers are as follows:

- PAC-125W Industrial PC Assembly, Backplane:HPP-10S /
- Motherboard: P4SVLL/2.53GHZ Pentium4 / 1GB RAM,
- 80GB Hard drive, DVD/R: 350W PWR Supply:
- 8 port Keithleys
- WIN XP Pro

The lane controller shall process all of the data obtained from the various lane subsystems to generate a transaction record for each vehicle passage through the toll lane. The lane controller shall:

1. Maintain the transponder status list used to validate the status of a transponder received from the AVI subsystem.
2. Obtain the toll rate and schedule data from the TCS Host and determine the toll charged to manual transactions, AVI transactions and violations. Determination of toll shall be performed at the lane controller.

3. Use the data obtained from the AVI subsystem and AVDC subsystem to assign the transponder read and classification to the correct vehicle.

4. Notify the VES to save and process vehicle images if the vehicle is flagged as a violation, class mismatch or speeder case per the NHDOT Business Rules.

5. Indicate the transmission status of the vehicle transaction recorded.

6. Transmit the transaction record with vehicle detection data, classification data, transponder data, and all other pertinent information regarding the vehicle to the TCS Host.

7. Transmit the violation images and data to the VES for further processing.

8. Transmits to the MOMS all alarm messages relating to the health of each subsystem, including the health of the lane controller.

9. Accept buffered reads from the AVI subsystems.

The lane controller software shall be configurable and able to support NHDOT's operational needs without requiring changes to software. All configurable parameters shall be presented via a graphical table for easy viewing and updating by the system administrator through the appropriate application software module. The configurable parameters shall be further defined during the design process.

The Contractor shall propose appropriate protocols and data structures to accomplish the communications required between various components and peripherals. These protocols and data structures shall be fully detailed by the Contractor during the design process and approved by the NHDOT prior to System Implementation. All files and messages between the lane controller, VES, AVI subsystem, AVDC subsystem and TCS Host shall utilize a guaranteed transmission protocol.

The lane controller application software shall support all lane functions required to meet NHDOT operational requirements. These functions are further detailed in the following sections:

C-3.6.12.1.1. Lane Controller Start-Up

Upon start-up or initialization, the lane controller shall perform a self-diagnostics test to ensure full system operations. Alarm messages shall be reported for all failure conditions and a notification of the diagnostic check completion shall be displayed on the MOMS monitoring screen. The lanes shall always come up in an open mode if critical systems as defined by the NHDOT are operational. The failure of a critical system shall result in the toll location operating under degraded operations in accordance with the Business Rules developed during the design phase.

Upon boot-up, the lane controller shall verify with the Plaza and TCS Host that it has the latest configuration files, application software, transponder status file, toll rates and schedules, and any other files required to support the lane operations. If the latest files are not present on the lane controller, it shall request the latest data from the TCS Host. The lane controller upon start-up shall also synchronize its time with the TCS Host and verify that the messages are synchronized.

C-3.6.12.1.2. Transaction Processing

The lane controller shall be required to detect, classify and frame vehicles, assign the transponder accurately to vehicles, and capture the image of the correct vehicle. The detailed transaction processing rules and the transaction message details shall be defined and finalized during the design phase; however, the following basic rules apply:

1. Each vehicle that passes through the toll lane shall be processed and reported as a transaction.
2. The System shall have the ability to process multiple transponders in a vehicle and report each transponder.
3. All non-IAG transponder reads shall be reported.
4. One transaction shall be created for each vehicle that travels through the tolling location and the lane controller shall ensure that the transaction is complete prior to transmitting it.
5. The lane controller shall ensure that duplicate AVI transactions (same Transponder ID) are not reported from the same lane within a configurable period of time.
6. Buffered Transponder Reads that are transmitted to the lane controller shall not be assigned to a vehicle by the lane controller but shall be flagged and reported to the Plaza or TCS Host for further processing and vehicle assignment.
7. The lane controller shall automatically synchronize with the various subsystems to ensure the events in the lane correspond to the transaction generated.
8. Each transaction shall contain and be reported with various event times including 'vehicle exit' time and 'Transponder read' time that shall allow Transponder reads, images and video to be associated correctly with the vehicle.

C-3.6.12.1.3. Value Based Pricing

The System shall have the capability to support Value-Based Pricing and separate rate tables for the various periods of congestion based upon time of the day, day of the week and holidays. The System shall have the capability to handle schedule based pricing should the NHDOT decide to activate this feature in the future. The System shall support

configurable rate programs including but not limited to commuter programs and discount programs, allowing different rates to be in effect based on the terms of the applicable program. In addition, the System shall support establishing toll schedules for special events that are activated during special event mode of operation. A Default Rate Table shall also be defined at the global, tolling location and lane level, which shall be used automatically when no specific rate table is defined for a specific time period.

C-3.6.12.1.4. Fare Determination

The System shall determine the toll for all transactions using the toll rates and schedules established for each of the tolling locations. The toll determination can be performed at the lane controller where every transaction shall have the correct cash, AVI and violation toll associated with the transaction based on the fare class as defined in this section. The current toll determination utilizes a barrier type tolling concept whereby a fare amount is charged at each tolling location that the vehicle passes through. Toll Rate Schedules shall be user configurable through a configuration menu at the TCS Host with the ability for global, plaza, and/or lane selection based on effective date/time of the change.

C-3.6.12.1.5. Fare Class

The TCS shall provide the necessary information to assign a fare class (as structured under the current system) to each transaction. While AVI fare class is currently handled by the CSC, the following rules shall be considered as part of the overall Business Rules considerations during the TCS design:

1. Cash Transactions
    a. For Staffed Lanes, the class shall be determined by the collector in the lane.
    b. For ACM lanes, if the AVDC system is not operational and no Transponder class is identified, the default class for the transaction will be Class 1.
    c. Collectors shall have the ability to add axles.
2. AVI Transactions
    a. If the AVDC system is not operational and no Transponder class is identified, the default class for the transaction will be Class 1 per the plaza fare (configurable).
    b. Transactions with 0 or 1 axle shall default to Class 1 per the plaza fare (configurable) if no Transponder class is detected. The TCS shall flag the transaction and all data shall be retained.
    c. If AVDC axles are greater than the highest class in the fare tables, and there is no Transponder class detected, the default class for the transaction will be

Class 1 per the plaza fare (configurable). The TCS shall flag the transaction and all data shall be retained.

3. Violations (non-payments in the lane)

    a. If the AVDC system is not operational, the default class for the transaction will be Class 1 per the plaza fare (configurable).

    b. Transactions with 0 or 1 axle shall default to Class 1 per the plaza fare (configurable). The TCS shall flag the transaction and all data shall be retained.

    c. If the AVDC axles are greater than the highest class in the fare tables, the default class will be Class 1 for the transaction per the plaza fare (configurable). The TCS shall flag the transaction and all data shall be retained.

C-3.6.12.1.6. Saving of Images

The System shall be designed such that the VES shall capture and save images even if the AVDC system is not operational. The current system requirement is seven (7) days but the Contractor shall indicate the updated storage capacity of the system and provide options for expanding this capacity if needed. Images shall be captured and saved for the following conditions:

1. In all cases where there is no valid Transponder read, the front and rear license plate image of all vehicles shall be saved.

2. Retention of images shall also be configurable based on violation type (i.e. Type 1, Type 2)

3. If the VES loses communications with the lane controller, a front and rear image of every vehicle shall be saved. Images saved during this condition shall be flagged and subsequently matched with the correct transaction data when communications with the lane controller resumes. This matching shall take place in a manner that does not interfere with or degrade real time lane controller operations.

4. If AVDC system is not operational but the VES trigger is functioning, images shall be saved such that all non-valid Transponder transactions that occur during the AVDC malfunction can be subsequently pursued for collection. Sufficient data shall be provided in the transactions to allow the CSC/VPC to process such transactions so that E-ZPass customers are not charged in error when lane operation is degraded.

C-3.6.12.1.7. Configuration Files

All parameters and settings required to run the lane controller application shall be maintained in configuration files. Access to configuration files required to support the lane controller operations shall be controlled and access to these files must be limited to authorized personnel.

The configuration files can be maintained on the TCS Host server or Plaza Server or downloaded along with the lane controller application file; however, authorized personnel shall be able to make changes to the configuration files in the field as approved by the NHDOT. All lane controllers shall have default configuration files that shall allow the lane to start-up automatically. Authorized personnel shall be able to make changes to parameters and settings that are defined as configurable elsewhere in this document and in the Approved design documents.

A method shall be developed such that the presence of outdated configuration files and software versions is detected and reported to the MOMS.

C-3.6.12.1.8. Interface to AVI SubSystem

The lane controller shall interface with the AVI System and transmit all data received from the AVI system. The lane controller shall report all tag reads; the details of the data format shall be finalized or confirmed during the design phase. The Contractor shall be responsible for ensuring that all data elements required by the CSC/VPC to meet NHDOT operational and IAG interoperability requirements are provided in the transaction.

C-3.6.12.1.9. Interface to AVDC SubSystem

The lane controller shall interface with the AVDC system to obtain vehicle events that shall permit accurate detection, profiling, classification, tracking and processing of vehicles. Vehicle speed information shall also be obtained from the AVDC system and reported as part of the vehicle transaction data.

C-3.6.12.1.10. Interface to VES

The lane controller shall interface with the VES to capture and process images of vehicles identified to be violators, class mismatches and speeders in accordance with the Business Rules to be developed and confirmed during the Design phase. Vehicle data and images obtained from the VES and transmitted to the CSC/VPC shall support the violation processing requirements.

C-3.6.12.1.11. Interface to TCS Host

All messages generated at the lane controllers shall be transmitted to the Plaza/Host server in near real-time and shall be guaranteed. All messages shall be uniquely identified and validation shall be performed at the Plaza/Host System to ensure that there are no missing or duplicate messages. The System shall support exception handling in accordance with

the NHDOT Business Rules Approved during the Design phase. An alarm shall be generated and reported to the MOMS for all exceptions/errors.

The Contractor shall provide an automated means of synchronizing the lane and host server messages in the event the lane controllers are replaced, if communications are down, or if data on the lane controller is not retrievable due to a catastrophic failure.

C-3.6.12.1.12. Interface to MOMS

All alarm and equipment/process health messages generated at the lane controllers shall be transmitted to the MOMS in real-time and shall be guaranteed. All messages shall be uniquely identified and validation shall be performed to ensure that there are no missing or duplicate messages. The MOMS shall automatically detect the failure of any equipment including but not limited to such items as lane controller, AVDC subsystem and components, AVI subsystem and components, TCS Host, workstations, UPS, etc).

C-3.6.12.1.13. Receiving Data

The lane controllers shall be capable of receiving files and tables from the applicable TCS plaza/host servers. Receipt of all files and data shall be verified and acknowledged and any failures in the transmission shall be reported to the MOMS.

- Tag Status File (ITAG): The lane controller shall be capable of supporting the IAG ITAG file and shall have the capability to support every NHDOT and its assigned transponder range as described in the interoperability specifications. The lane controller shall be capable of accepting comprehensive (complete list once a day) and incremental (changes updated on a configurable interval, but not less than on an hourly basis) tag status files and shall activate the lists upon receipt after validation of the files. The Contractor shall use an effective design to transmit the files (compress, encode, and transmit), store the files and use the files such that the new list is available at the lane controllers within 10 minutes of the applicable TCS Plaza/Host server obtaining the new list. Transponder validation shall occur in no greater than 50 milliseconds all exceptions to this requirement shall be clearly explained and detailed in the Proposer's proposal. The format of the file shall be finalized during the design phase.

- Toll Rates and Schedules: The lane controller shall be capable of implementing value-based pricing that varies by time of day, day of the week, and holiday. The toll rates are based on vehicle class and payment type. The toll rates and toll schedules and the effective time shall be downloaded to the lane controller (if applicable) when the toll rate structure changes. The System shall permit the NHDOT

to schedule toll rates and schedules changes in advance of the new rates becoming effective.

- Configuration Files: All configuration files and tables needed to support the lane operations shall be downloaded to the lane controllers from the TCS Host upon confirmed change or at scheduled intervals and activated as required. Versions of the configurable files on each lane controller shall be maintained, tracked, and recorded.

- Software Download: All lane controller software shall be downloaded to the lane controllers from the TCS Host and versions on each lane controller shall be maintained, tracked, and recorded. Record and release notes of downloads shall also be submitted to the NHDOT every six (6) months in summary format.

C-3.6.12.1.14. Transmitting Data

The lane controller shall transmit to the TCS Plaza/Host System the toll collection data including but not limited to those identified below.

1. All transaction messages generated in the lanes.
2. All alarm and status messages generated in the lanes.
3. All lane operational communication status messages and self-health messages.
4. All events generated in the lanes that are displayed on the real time screen or are required at the TCS Plaza/Host System.

All messages shall be confirmed as received by the TCS Plaza/Host System before they are flagged for archiving. In the event of communication failures the messages shall be stored on the lane controller until successful transmission is complete and verified. The exception handling process shall be instituted in accordance with the Business Rules approved during the Design phase and all failed transactions shall be identified and reported. Any exceptions or failure shall result in the creation of an alarm that is reported to the MOMS.

C-3.6.12.1.15. Monitor All Lane Equipment for Device Status

Each lane controller shall monitor itself and associated in-lane equipment devices for status. All systems including AVI, AVDC and VES shall be continually polled (once per minute or frequency to be recommended by the Contractor and approved by the NHDOT) for status. The health of some digital devices shall be inferred from events. If a device recovers after reporting a failure, then a recovery message shall be generated and

the device operational status restored. The MOMS shall determine if it has lost communication with the lane controller, and generate an alarm message if communication is unavailable. All alarm, health and recovery messages shall be transmitted to the applicable servers and reported to the MOMS and the real time screen.

C-3.6.12.1.16. Diagnostics and Equipment Malfunction

The lane controller software shall execute periodic diagnostic checks on in-lane equipment. Intelligent peripheral devices shall be interrogated for device status on a regular basis. A device's failure to respond to a status inquiry, after a configurable number of retries shall be regarded by the lane controller software as an equipment failure. In the event of this failure a message shall be sent to the applicable plaza or host servers and reported to the MOMS. Such tests shall take place in all modes of lane operation, and the results shall be placed in each lane controller's event log.

Degraded modes of operation shall be supported based on Business Rules developed during the design process. The Contractor shall ensure the TCS continues to operate without loss of revenue or visible impact to the customer in accordance with the degraded mode operations agreed to during the design phase in the event that certain designated components of the TCS fail.

C-3.6.12.1.17. Stand-alone Mode of Operation

The lane controller shall be capable of operating in a stand-alone mode for a minimum of thirty (30) days if communications to the TCS Plaza/Host System are down. When operating in this mode, the last files downloaded from the applicable plaza or host server shall be used while processing vehicles. Upon re-establishing communications with the applicable plaza or host server or existing plaza/host computer, all back-logged messages shall be transmitted to each of the servers without affecting the real time operations or degrading the lane operations. If any downloads were initiated while the communications were down, then these files shall be re-transmitted to the lane controller to bring it up to-date.

The lane controller shall have a port to permit on-site manual uploading of software, transponder status files, toll rates (if applicable) or other pertinent data required for continued operation until communications with the TCS Plaza/Host System is re-established. Additionally, technicians shall have the ability to download transactions from the lane controller and transfer such transactions to the TCS Plaza/Host System.

Upon re-establishing communications with the TCS Plaza/Host System all back-logged messages shall be transmitted to the TCS Plaza/Host System without affecting the real time operations or degrading the lane operations. Manually transferred transactions shall also be transmitted and the TCS Plaza/Host System shall ensure all transactions are synchronized. If any downloads were initiated while the communications were down, then

these files shall be re-transmitted to the lane controller to bring it up to-date; however, in the case of dynamic toll rate and travel times, only real-time data shall be transmitted (if applicable). Upon re-establishment of communications and successful transmission of all messages, a recovery message shall be transmitted to the MOMS.

C-3.6.12.1.18. Time Synchronization

All lane controllers shall be synchronized either to the TCS Plaza/Host System as a primary source or to a common time synchronization source. There shall be a second source for time synchronization if communication to the primary source is down. The software used for time synchronization shall support monotonic changes to time. The lane controller shall synchronize or transmit time synchronization messages with every device in the lane capable of maintaining time.

C-3.6.12.1.19. Operating Systems and Software

The Contractor shall also represent in their proposal the operating system platform on which the lane controller software application(s) will be operating.

C-3.6.12.1.20. Installation Requirements

If the existing lane controllers are to be reused they shall remain the same location.

In the event the Contractor deems it necessary to replace the existing lane controllers, they may reuse the existing cabinet housing and location in the tunnel. Alternative locations for lane controllers shall be clearly identified in the Contractor's proposal.

Point-of-Collection Equipment

C-3.6.12.1.21. Toll Collector Terminal and Related Equipment

C-3.6.12.1.21.1. Toll Terminal

As is currently functioning, the Toll Terminal interface shall facilitate and support all toll collection operations and functions in the attended lanes. Toll attendants shall use the touch-screen feature on the Toll Terminal to navigate through the various menus and screens. The user interface shall provide a clear feedback to the user to acknowledge user input.

The interface shall be user-friendly and shall be designed to minimize Repetitive Motion Injuries (RMI) that could result from repeated use of the terminals. The buttons on layered screens shall be positioned in such a way so as to avoid accidental inputs.

The Contractor shall propose appropriate layout and design for the Toll Terminal menus and screens for review and approval by the NHDOT.

C-3.6.12.1.21.2. Receipt Printer

The Contractor shall reuse the existing in lane receipt printer.

C-3.6.12.1.21.3. Canopy Override Switch

There is an existing canopy override switch in each lane. The purpose of this switch is to allow collection staff to manually override that canopy lane status. The override switch is not currently integrated with the TCS and the Contractor shall not be required to do so. It however shall be maintained throughout the course of the contract and subsequent maintenance term(s).

AVI Subsystem

NHDOT requests that the Contractor reuse the existing E-ZPass AVI subsystem which is provided by Kapsch (previously Mark IV Industries). The readers are typically located in NEMA-type fully enclosed cabinets on the toll islands.

It is expected that the current AVI subsystem will not require any retrofit or re-installation. The Contractor may however at its own discretion determine if relocation of any AVI subsystem component is necessary. Any such relocation shall be subject to the approval of the NHDOT. The Contractor shall also be responsible for the performance of the AVI subsystem during Interim Maintenance, new TCS installation and subsequent maintenance services of the new TCS throughout the life of the Contract.

Vehicle Detection and Classification

The Contractor shall reuse the existing vehicle classification subsystem in its current installed configuration.

The Contractor, at its discretion, may propose an alternative vehicle classification subsystem or configuration utilizing the existing equipment.

The current in-lane vehicle classification and detection subsystem is comprised of:

- IDC Loop and detector,
- TRMI Treadles (2 contact with frame); and
- AutoSense II overhead laser scanner.

Attendant Identification Display

The Contractor shall reuse the existing Attendant Identification Display in each lane. These displays are typically located on the exterior of the booth in view of the patron.

The purpose of the Attendant Identification Display is to display to the public the attendant (collector) ID number that is currently operating the lane. Under the new TCS the lane

Attendant ID Display shall continue to display the attendant ID number as long as the collector is logged onto the lane.

The NHDOT may elect to phase out the use of the Attendant ID display.

Patron Feedback Display (PFD)

NHDOT requests that the Contractor reuse the existing PFD in each lane. The PFD's are located downstream of the toll booth at the end of the toll island. The PFD provides feedback to patrons as they are processed in the lane related to fare paid, balance due, E-ZPass status feedback, etc.

The PFD are capable of displaying 3 lines of 6 characters at 4 inches high. The new TCS shall be capable of displaying a variety of messages which shall be determined during the design process and subject to approval by the NHDOT.

Lane Traffic Signal

NHDOT requests that the Contractor reuse existing lane traffic signal be reused. The lane traffic signal is pedestal mounted and co located with the PFD at the end of each toll island. The traffic signal provides indication to the patron via red or green illumination, of the status of the toll transaction. The lane traffic signal also contains an enforcement beacon which is activated upon violation, run through, or when a vehicle leaves an ACM lane prior to completion of fare processing.

During the design process the Contractor shall work with the NHDOT to determine the business rules regarding light indication for each of the lane mode types.

Canopy Lights

NHDOT requests that the Contractor reuse the existing canopy lights. The canopy lights are mounted overhead of each lane on the toll plaza canopy.

The purpose of the canopy light is to inform oncoming traffic of whether a lane is open or closed. The Contractor shall integrate the new TCS with the existing canopy lights so that they are controlled by both the lane controller based on lane open status and the override switch as well.

Lane Feed Back Operations

The following are the business rules and policies currently in place and used to determine the status of the various patron feedback devices during a transaction:

C-3.6.12.1.22. Dedicated E-ZPass Lane

C-3.6.12.1.22.1. Valid Tag

Idle State	Red off, green off, PFD blank
Active State	Valid tag read Green on PFD "GO E-ZPASS" End of vehicle
Idle State	Red off, green off, PFD blank

C-3.6.12.1.22.2. Valid Non-Revenue Tag

Idle State	Red off, green off, PFD blank
Active State	Valid NH-NR tag read Green on PFD "GO E-ZPASS" End of vehicle
Idle State	Red off, green off, PFD blank

C-3.6.12.1.22.3. Low Balance Tag

Idle State	Red off, green off, PFD blank
Active State	Low balance tag read Green on PFD "LOW BAL CHECK ACCOUNT" End of vehicle
Idle State	Red off, green off, PFD blank

C-3.6.12.1.22.4. Invalid or Lost/Stolen Tag

Idle State	Red off, green off, PFD blank
Active State	Invalid or Lost/Stolen tag read Green on PFD "UNPAID CALL E-ZPASS" Type 1 violation detected (toll violation) End of vehicle
Idle State	Red off, green off, PFD blank

C-3.6.12.1.22.5. No Tag Read

Idle State	Red off, green off, PFD blank
Active State	Front of vehicle detected by the AVDC sensors PFD " UNPAID CALL E-ZPASS" Type 1 violation detected (toll violation) End of vehicle
Idle State	Red off, green off, PFD blank

C-3.6.12.1.22.6. Class Mismatch

Idle State	Red off, green off, PFD blank
Active State	Valid tag read Green on PFD "GO E-ZPASS" Type 2 violation detected (Class mismatch violation) End of vehicle
Idle State	Red off, green off, PFD blank

C-3.6.12.1.22.7. Speed Violation

Idle State	Red off, green off, PFD blank
Active State	Valid tag read Green on PFD "GO E-ZPASS" Type 2 violation detected (Speed violation) End of vehicle
Idle State	Red off, green off, PFD blank

C-3.6.12.1.23. E-ZPass/Manual Lane

C-3.6.12.1.23.1. Valid E-ZPass Tag, Class Mismatch

Idle State	Red on, green off, PFD blank
Active State	Valid tag read Red off Green on Good tone Terminal: E-ZPASS

	PFD "GO E-ZPASS" End of vehicle Class mismatch detected
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.2. Valid E-ZPass Tag

Idle State	Red on, green off, PFD blank
Active State	Valid tag read Red off Green on Good tone Terminal: E-ZPASS PFD "GO E-ZPASS" End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.3. Low Balance E-ZPass Tag

Idle State	Red on, green off, PFD blank
Active State	Low Balance tag read Red off Green on Good tone Terminal: Call E-ZPass If patron asks, give E-ZPass handout PFD "LOW BAL CHECK ACCOUNT " End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.4. Invalid/Lost/Stolen E-ZPass Tag, Cash Payment

Idle State	Red on, green off, PFD blank
Active State	Invalid tag read Red off Green on Bad tone Terminal: Accept payment if offered PFD: "UNPAID CALL E-ZPASS Patron stops to pay Attendant classifies PFD "FARE DUE $.75" Patron pays Attendant MOP's US-CASH MOP tone PFD "PAID / THANK YOU" End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.5. Invalid/Lost/Stolen E-ZPass Tag, No Payment

Idle State	Red on, green off, PFD blank
Active State	Invalid tag read Red off Green on PFD: "UNPAID CALL E-ZPASS" Bad tone Terminal: Call E-ZPass End of vehicle Violation light flashes and alarm sounds
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.6. Valid E-ZPass Tag, Patron Pays Cash

Idle State	Red on, green off, PFD blank
Active State	Valid tag read Red off Green on Good tone Terminal: E-ZPASS PFD "GO E-ZPASS" Patron has tag, does not want to use it, and tenders cash Attendant cancels E-ZPass PFD blank Red on Green off Attendant classifies vehicle PFD: "FARE DUE $.75" Attendant MOP's Red off Green on PFD "PAID THANK YOU" Receipt possible End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.7. Tag Skip Read from Next Vehicle

Idle State	Red on, green off, PFD blank
Active State	Valid tag read Red off Green on Good tone Terminal: E-ZPASS PFD "GO E-ZPASS" Patron has no tag and tenders cash Attendant pushes <Defer> button PFD blank

	Red on Green off Attendant classifies vehicle PFD "FARE DUE $.75" Attendant MOP's MOP tone Red off Green on PFD "PAID THANK YOU" Receipt possible End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.8. Late Tag Wave

Idle State	Red on, green off, PFD blank
Active State	Attendant classifies PFD "FARE DUE $.75" Patron presents tag but too late to read Attendant gives patron handout and tells patron to proceed and violate Front of vehicle event Sound alarm and flash violation light
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.9. US Cash

Idle State	Red on, green off, PFD blank
Active State	Attendant classifies PFD "FARE DUE $.75" Patron pays Attendant MOP's US-CASH Red off Green on MOP tone PFD " PAID THANK YOU "

	Receipt possible End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.10. Insufficient/No Funds

Idle State	Red on, green off, PFD blank
Active State	Attendant classifies PFD "FARE DUE $.75" Patron does not have adequate amount of funds for toll payment Attendant activates "NO FUNDS" button Red off Green off PFD: "THANK YOU" Receipt printer prints two no-funds documents: • Attendant manually fills out one receipt with patron information, and keeps it • Attendant hands over the other receipt to the patron End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.11. No MOP (No Pay)

Idle State	Red on, green off, PFD blank
Active State	Attendant classifies PFD "FARE DUE $.75" Patron does not pay or attendant tries to MOP too late Front of vehicle event Sound alarm and flash violation light
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.12. No Classification

Idle State	Red on, green off, PFD blank

Active State	Attendant does not classify Patron may or may not pay or attendant tries to classify and MOP too late PFD "UNPAID CALL E-ZPASS" Front of vehicle event Sound alarm and flash violation light
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.13. Canadian Paper, Change Due

Idle State	Red on, green off, PFD blank
Active State	Attendant classifies PFD "FARE DUE $.75" Patron overpays with Canadian paper money Attendant MOP's Canadian Bills Attendant keys amount tendered Terminal displays US change due patron Attendant hands over change to patron Red off Green on MOP tone PFD "PAID THANK YOU" Receipt possible End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.14. Canadian Paper, More Due, Paid Exactly

Idle State	Red on, green off, PFD blank
Active State	Attendant classifies PFD "FARE DUE $4.00" Patron pays $5.00 Canadian Attendant MOP's Canadian Bills Attendant keys amount tendered Terminal displays additional US amount due attendant $0.25 Patron tenders additional amount due in US coins or Canadian coins. Red off Green on Good tone PFD " PAID THANK YOU " Receipt possible End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.15. Canadian Paper, More Due, Overpaid

Idle State	Red on, green off, PFD blank
Active State	Attendant classifies PFD "FARE DUE $4.00" Patron pays $5.00 Canadian Paper Attendant MOP's Canadian Bills Attendant keys the amount tendered "5" Terminal displays additional US amount due attendant $0.25 Patron tenders $5.00 paper Canadian Cash Attendant keys additional amount tendered "5" Terminal displays US change due patron of $3.50 Attendant hands patron change Red off Green on MOP tone PFD " PAID THANK YOU " Receipt possible End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.23.16. CAN Paper, More Due, Overpaid Coin

Idle State	Red on, green off, PFD blank

Active State	Attendant classifies PFD "FARE DUE $4.00" Patron pays $5.00 Canadian paper Attendant MOP's Canadian Bills Attendant keys amount tendered "5" Terminal displays additional US amount due attendant $0.25 Patron tenders $1.00 Canadian coin Attendant hands patron $.75 US coin change MOP tone PFD " PAID THANK YOU " Red off Green on Receipt possible End of vehicle
Idle State	Red on, green off, PFD blank

C-3.6.12.1.24. ACM Only Lane

Idle State	Red on, green off, PFD "$.75"

C-3.6.12.1.24.1. Class 1 Full Payment or Overpayment

Idle State	Red on, green off, PFD "$.75"
Active State	Patron pays or overpays fare Red off Green on PFD "PAID THANK YOU" End of vehicle
Idle State	Red on, green off, PFD "$.75"

C-3.6.12.1.24.2. Class 1 Full Back-out Case W/O Net Axles

Idle State	Red on, green off, PFD " $.75"
Active State	Exit loop on Two forward axles Patron backs up and goes to another lane Two reverse axles Exit loop off
Idle State	Red on, green off, PFD "$.75"

C-3.6.12.1.24.3. ACM Class 1 Partial Back-out (Overshoot)

Idle State	Red on, green off, PFD "$.75"
Active State	Exit loop on Two forward axles Patron backs up to the ACM Two reverse axles Exit loop off Patron pays fare at the ACM Red off Green on PFD "PAID THANK YOU" Exit loop on Two forward axles are detected

	Exit loop off
Idle State	Red on, green off, PFD "$.75"

C-3.6.12.1.24.4. Non-Class 1 (Class Violation)

Idle State	Red on, green off, PFD "$.75"
Active State	Patron pays fare Red off Green on PFD " PAID THANK YOU " End of vehicle AVDC detects a vehicle class that is greater than class 1 Sound alarm and flash violation light
Idle State	Red on, green off, PFD "$.75"

C-3.6.12.1.24.5. No/Insufficient Payment

Idle State	Red on, green off, PFD "$.75"
Active State	Patron pays no/insufficient fare Exit loop on Sound alarm and flash violation light Exit loop off
Idle State	Red on, green off, PFD "$.75"

C-3.6.12.1.25. Miscellaneous Cases

C-3.6.12.1.25.1. Closed Reversible Lane

Idle State	Red on, green off, PFD blank
Active State	Vehicle moves through post class system, hitting exit loop or AutoSense detection fields first. Post class detection reports vehicle is present System detects reverse direction of vehicle based on order of AutoSense beam messages Sound alarm and flash violation light Post class detection reports vehicle is no longer present

Idle State	Red on, green off, PFD blank

C-3.6.12.1.25.2. Closed Non-reversible Lane

Idle State	Red on, green off, PFD blank
Active State	Vehicle moves through post class system, hitting exit loop or AutoSense detection fields first. Post class detection reports vehicle is present System detects direction of vehicle based on order of AutoSense beam messages Sound alarm and flash violation light Post class detection reports vehicle is not present Log U.O. Message (configurable)
Idle State	Red on, green off, PFD blank

C-3.6.12.1.25.3. Special Events

Idle State	Red off, green on, PFD blank
Active State	Post class detection reports vehicle is present Post class system detects vehicle class based on axles and dual tires Transaction is assigned an indicated class equal to the detected class as reported by the post class system The MOP of Non-Revenue with the Special Events unusual occurrence code is recorded.
Idle State	Red on, green off, PFD blank

Equipment Enclosures

All existing equipment enclosures may be reused at the discretion of the Contractor. Any new enclosures shall be subject to the approval of the NHDOT and compliant with all UL and NEMA standards.

C-3.7. Plaza Level Requirement

C-3.7.1. Plaza Functional Requirements

Money Bag Handling

Each toll plaza administration building contains a money room with a vault to secure the revenue collected from the lanes. In the plaza vault, the receipts of toll attendants are held individually in money bags. Each tamper-proof bag is tagged for the attendant identification. Revenues are not counted by the toll plaza staff.

The coins from ACM are directly collected into money bags which are inserted in the coin vaults. The contents of the money bags are secured by tamper-proof plastic seals and tagged for identification. Secured bags are held in the toll plaza vault.

Data from the lane controllers is transferred to the TCS Host.

The money room's workstation will have a user interface that will allow authorized users to associate the moneybag(s) number(s) with the attendant TOD based on the revenue day indicated. The workstation will be equipped with a barcode reader that will enable reading of the unique barcode label of the moneybag. If the moneybag is associated with a manual lane, then the supervisor will be required to enter the attendant's ID. The data generated during the cash-out process will be sent to the host system for use in a variety of reports that will support auditing tasks.

At the end of a shift, the attendants will bring their money bags to a secure room at the plaza to be counted and then picked up by the NHDOT's money processing vendor. The end-of-shift functionality to be provided by the system shall be to tie together the money bag(s) number(s) with the attendant tour of duty. This will be achieved through use of a unique bar code label and the attendant's ID. The system shall also be capable of identifying duplicate money bag labels (numbers).

The money processing vendor will provide pre-printed sheets of unique bar code labels. The format of the pre-printed bar code label is as follows:

Table 3-4 Pre-Printed Bar Code Format

X	**XX**	**XXXXXX**
Bag Identifier	Plaza ID	Unique Number
Vault = 1	01 thru 12	
Attendant = 0		

When the attendants bring in their money bags, the supervisor will affix a bar code label to the bag. The supervisor will then attach a matching barcode label to a tag on the bag. The attendant will then seal the money bag. The Proposers shall identify in their responses how their proposed TCS will be able to tie the attendant IDs and bar code numbers together and allowing association of the attendant's tour-of-duty and the contents of the money bag.

The system shall allow multiple money bags to be associated with one tour. This will enable the currency and coin to be separated into separate bags should operational procedures warrant this.

When a money bag is removed from a vault, the Supervisor will seal the bag and fasten a tag to the bag. The supervisor will then attach the pre-printed unique bar code label (supplied by the money processing vendor) on the tag fastened to that bag.

The Proposers shall identify in their responses how their proposed TCS will be able to tie the vault IDs and bar code numbers together and allowing association of the vault's tour-of-duty and the contents of the money bag.

Random Bag Audit

Random bag audits shall be carried out at the plaza as directed by the Audit Department, primarily as a check against the performance of the money processing vendor counting contract. The required attendant bags shall be opened by the Supervisor and the money counted and keyed into the system. The money will be returned to the bag and sent to the money processing vendor with the rest of that day's money bags. The system shall provide a user interface for entering the results of the count information. Currently the coins are not counted, only currency is counted. However the user interface shall provide the ability to enter coin counts if operational procedures change at a later date.

Manifest Generation

Each morning, the previous day's money bags from attendants and vaults will be picked up by the money processing vendor. All bags picked up in the morning will be assigned to the previous day's revenue. Attendant shifts are designed to start and finish around midnight to ensure that the money picked up the next morning fairly closely reflects revenue collected on the previous day. Any bags brought in to the money room from post-midnight shifts will be kept separate from the previous day's bags and will be picked up by the money processing vendor on the next day. Prior to the bags being picked up by the money processing vendor, a manifest will be generated that will list bar code numbers for all bags to be picked up. The user shall also have the ability to manually add bags to or delete bags from the manifest.

Change Fund Management

The system shall provide basic functionality to enable management of the Change Fund held at each plaza. This functionality shall include setting of a base change fund amount, placing change orders, change order fulfillment and associated reporting. The system shall be capable of setting standard change fund orders daily by plaza.

Plaza Monitoring

The system shall provide the ability to simultaneously display real-time status and activity of all lanes at the plaza including the ability to monitor the status of all the lane and plaza devices. This functionality shall be available primarily at the plaza level but shall also be available from any other node on the NHTCS network including workstations in the Turnpike Administration building. Lane statuses, including open, closed, standby mode, maintenance mode and degraded communications (i.e., no communications with the lane controller), shall be indicated in different colors. The plaza system shall be capable of displaying toll transaction activities in all plaza lanes or in an individual lane. The overall design and layout of the plaza monitoring screen shall be designed with ease of use and simplicity in mind. Extra or erroneous information is not desired.

C-3.7.1.1.1. Alarm Monitoring

The system shall have the ability to generate alarms for all failures and unusual conditions at the lane and plaza level and notify the appropriate toll road personnel about such malfunctions and unusual occurrences. The system shall clearly identify the date and time of the alarm, a description of the alarm/equipment failure and location of the alarm/equipment failure. The Contractor shall clearly define all the system generated alarms for review and approval by the Project Manager.

As these malfunctions and unusual occurrences are detected, they shall be reported to the MOMS which will evaluate the message and determines if it is a major alarm.

If a message is a major alarm, it will be sent to Plaza Monitor and an indicator will pop-up with an icon that will flash continuously and an alarm that will sound periodically until the toll supervisor acknowledges the message. The alarm may be acknowledged by dismissing the incident if it is resolved so that it will not appear again, or it may be "silenced" temporarily to quiet the alarm for an adjustable interval of time. The alarm will resume making noise after the interval is passed, until it is dismissed, or until it is silenced again.

Based on the severity of the event and the number of times it has been detected, the system shall generate an alert message that will notify one or more individuals based on the affected part and the part's location.

Remote Management (Lane open/closed, etc)

The Toll Supervisor shall have the ability to remotely open a lane, close a lane, change lane mode, and switch vaults if necessary.

Plaza Administration Application

Each workstation at the plaza will be able to use Internet Explorer to access the toll system Plaza Administration application on the web server at the TCS Host. The Plaza Admin application shall require a secure login and provide access to different levels and features

based on the user's access level. Functions shall be selected from the main menu for the following functional areas:

- Employees
- Cash-out
- Fares
- Auditing
- Report generation
- Maintenance

C-3.7.2. Plaza Technical Requirements

Workstations

Workstations may be reused or upgraded by the Contractor for reuse as required to access any of the server or web based applications of the toll system.

The Contractor shall provide any necessary updates to the existing workstations to continue access to the system once the Host System has been upgraded. Workstations shall be equipped with the peripheral equipment needed for operations and shall be installed in designated offices to provide the required access. In addition, all workstations connected to the NHDOT toll collection network shall be able to access the application software and, based on access privileges, appropriate menus and screens shall be made available to the user.

Under the maintenance term these workstations shall also be maintained as part of the new TCS.

Printers

These Plaza printers are provided by DoIT but are to be maintained and configured by the Contractor as part of the new TCS and maintenance term(s).

Plaza TCS Servers

The Contractor shall furnish and install new plaza servers should the new TCS design utilize a server at toll plazas. Final physical configuration of the servers shall be defined during the design efforts and subject to the approval of the NHDOT.

Plaza VES Servers

NHDOT requests that the Contractor reuse the existing plaza VES servers with the new TCS as they were recently upgraded in 2009.

Plaza VES Server Interfacing with the CSC/VPC

The interface with the E-ZPass CSC/VPC is described in the ICD provided in Appendix I which addresses the TCS to CSC/VPC Communication Interfaces.

In essence, the CSC/VPC will receive Violation Images Files from the Plaza VES server. Single or multiple Violation Image File(s) will be retrieved at any time of the day, normally a short time after the image file was created. These violation files will be associated with Type 1 violations (Toll Violations) only detected at the Dedicated E-ZPass lane.

Upon the detection of Type 1 violation, the Plaza VES system will save the front and rear images together with a unique ticket number at its bulk storage area. The ticket number will be created by the Plaza VES system and be used as part of the violation image naming scheme. The ticket number will include two digits to designate the plaza number, two digits to designate the lane direction and number, and additional sequential digits to be used in creating the unique ticket number for each Type 1 violation record. The ticket number for each violation Type 1 record will be used with two separate data records:

- With the transaction record that is sent to the Host System. This transaction record is included in the transaction file (for Type 1 violations) that is sent daily from the Host to the CSC/VPC
- With the violation image record that is sent from the Plaza VES Server to the CSC/VPC system.

By having an identical ticket number that is used with both the transaction record and the violation image record, the CSC/VPC would be able to accurately combine the violation image record with the transaction record for the same violating vehicle.

The Violation Image File that would be sent from the VES server to the VPC will include the use of a naming scheme that identifies whether the image is a front or a rear image as well as an identification of the ticket number for that violation. In other words, the image file name for the front image and for the rear image will include the same ticket number but will also identify whether it is associated with the front or the rear image.

C-3.8. Host Level Requirements

C-3.8.1. Host Functional Requirements

The TCS shall be administered and controlled by a Host Computer System that performs the following functions at a minimum:

- Tag Status File Management
- Management of User Access Privileges
- Toll Rate/Schedule Management

- Maintenance On-line Management
- Financial Audit and Reconciliation
- Transactional Audit and Reconciliation
- Real-time Monitoring
- Interface to E-ZPass CSC/VPC
- Interface to Plaza Computers
- Interface to Toll Lane Controllers
- Interface to ORT Host Computer
- Interface to the Money Processing Vendor

The Contractor shall provide the software and hardware needed to support Host System requirements specified herein. All transactions, images and messages transferred between all subsystems shall be guaranteed and have the required data validation protocols to confirm the accuracy and validity of data transfer.

C-3.8.2. Interface with the E-ZPass CSC/VPC

The NHDOT TCS and E-ZPass CSC/VPC are presently provided by separate vendors. Therefore, the NHDOT TCS has an interface with the Customer Service Center. The Contractor will only be responsible for data integrity up to the interface point between the NHDOT TCS and the CSC/VPC System.

This interface and its related reports will provide for communication of all specified files between the TCS Host System and the CSC System, and allow for reconciliation of all data and files sent and received from the interface.

The NHDOT Host shall interface to the E-ZPass CSC/VPC for the transfer of transactions and obtaining of the Transponder Status file. NHDOT requires the use of IAG Inter-Customer Service Center File Specifications and the NHDOT TCS to E-ZPass CSC/VPC Interface Control Document provided in Appendix I. This document describes both the Transaction file exchanges and the Tag Status file exchanges among the two entities.

C-3.8.3. Interface with the ORT System

The NHDOT TCS and ORT System may be provided by separate vendors. Therefore, the NHDOT TCS Host may have an interface with the ORT Host. The Contractor will only be responsible for data integrity up to the interface point between the NHDOT TCS and the ORT Host.

This interface and its related reports will provide for communication of all specified files between the TCS Host and the ORT Host, and allow for reconciliation of all data and files sent and received from the interface.

NHDOT requires the use of the NHDOT TCS to ORT TCS Interface Control Document (ICD) located in Appendix I. This document describes both the Transaction file exchanges and the Tag Status file exchanges among the two Host systems.

There are two types of data exchange transmissions. They are:

- ORT Transactions are sent to the TCS Host by the ORT subsystem in batch files periodically throughout the day (this currently done once every hour). There is a protocol that describes the file exchange.
- Tag Status files are sent to ORT system by the TCS Host as they are received from the CSC.

The Host System shall have the ability to receive transactions from the ORT Host in real time and in batch mode (at configurable intervals/transactions). The format and protocol for the transmission of the transactions shall be in compliance with the existing ORT to TCS Host System interface as coordinated with the ORT System Contractor during the design phase. The Host System shall be capable of transmitting the Transponder Status files for all IAG agencies received from the E-ZPass CSC to the ORT Host System.

C-3.8.4. Communications Interface

The TCS shall include a communication interface to the Customer Service Center. This may occur through an FTP Interface between the TCS Host and the E-ZPass Customer Service Center as is the current practice. The communication process specified assumes the use of an FTP interface, but may be changed by mutual agreement of the Contractor and Customer Service Center provider.

It is anticipated that all files generated from the Host Computer will be "retrieved" by the TCS Host System from the FTP Interface server so that they could be "picked up" by the E-ZPass Service Center. The E-ZPass Service Center will "push" all files it is responsible for generating in a similar fashion to the FTP Interface server so that they could be "picked up" by the TCS Host System. This protocol is typical of most IAG CSC to CSC communications.

The Communications Interface and associated protocols shall support the transfer of VES images and image/OCR information as part of the files generated by the Host Computer from the TCS to CSC should NHDOT elect this optional functionality.

The Contractor will be responsible for internal networking and connection to the proposed FTP server. The Contractor will also be responsible for providing the FTP service. The CSC provider will be responsible for providing, and maintaining a connection to the FTP service via a communication link from the TCS Host to the Customer Service Center. A dial-up telephone backup will also be provided by the NHDOT in the event the primary communication line between the TCS Host and the CSC is lost.

C-3.8.5. File Transfers

The interface file specifications for the files passed between the TCS Host Computer and the Customer Service Center shall follow the E-ZPass Inter-Customer Service Center Interface File Specifications and the NHDOT TCS to CSC/VPC ICD provided as an exhibit to this RFP. This includes the use of acknowledgement and check files as required for the transaction and tag status files.

The TCS shall also be capable of determining and providing alert, reporting or similar alarm messaging when files are not received from the CSC/VPC or an indicated discrepancy.

The Contractor will be responsible for parsing the Tag Status File into whatever format is suitable for the operation and collection of E-ZPass toll transactions as part of their system design.

No files will be transmitted from the Customer Service Center to the TCS Host System that will modify any of the expected toll revenues generated by the TCS Host System. Any adjustments to revenue due to non-revenue transactions, rejected IAG transactions or other toll rate corrections will be processed and accounted for at the Customer Service Center level.

E-ZPass Transaction Files

There are three types of transaction files that shall be sent daily from the Host System to the CSC/VPC systems via the TCS Host to CSC ICD in Appendix I. they are:

- An E-ZPass transactions file for all normal (non-violating) E-ZPass transactions that will be sent from the Host to the CSC ("N" file)
- An E-ZPass transactions file for all E-ZPass Type 2 transaction violations (speeding and class mismatch) that will be sent from the Host to the CSC ("C" file)
- A transactions file for all Type 1 violations recorded in Dedicated E-ZPass lanes (violations that are associated either with untagged violations, E-ZPass transactions using tag status 3 or 4, or invalid tags) that will be sent from the Host to the CSC/VPC ("V" file)

The system will follow the file naming convention with "from agency" and "to agency" being the same IAG agency "026" specified for the New Hampshire DOT.

All transaction files will be retained for a period of 90 days for use in transaction reconciliation. All transaction files transmitted from the Host to the Customer Service Center will be stored in a non-compressed format on the host system and be available for review by the NHDOT. These files may be stored on a removable media in a compressed

format. The Host System will include the tools and system documentation for retrieval of the retained data.

E-ZPass Tag Status Files

The E-ZPass Service Center will generate a Tag Status File daily. The Tag Status File will follow the IAG Inter-Customer Service Center Interface File Specification for tag status files, commonly referred to as the ITAG file. As per the specification, all fields will be filled. The Tag Status File will contain all of the New Hampshire issued tags as well as all the tags received by the CSC from away agency Tag Status Files. The Tag Status File transmitted by the Customer Service Center will be in transponder Serial Number order by issuing agency. In other terms, the issuing agency code could be considered the first three digits of the serial number and then the entire file would be in serial number order. The Tag Status File may be transmitted in a compressed format mutually agreed to by the Contractor and the CSC provider. There will typically be only one transmission of Tag Status information daily.

The Contractor will be responsible for parsing the Tag Status File into whatever format is suitable for the operation and collection of E-ZPass toll transactions as part of their system design. The Contractor will provide a Tag Status validation protocol that will daily reconcile the tag status files at the lane level with the Tag Status File transmitted from the Customer Service Center. The "parsing" software will have the ability to generate tag status files for any new IAG member agencies that may be added from time to time to the Tag Status File without any extensive program modifications to the host software.

The CSC will generate a single file and will follow the file naming convention with "from agency" and "to agency" being the same 026 specified for the New Hampshire DOT.

All Tag Status Files Received by the Host System will be retained for a period of 90 days for use in transaction reconciliation. These files may be stored on a removable media in a compressed format.

The Host System will include the tools and system documentation for the retrieval of the retained data.

C-3.8.6. Interface with the Money Processing Vendor

An armored car service collects all of the money bags held at the toll plazas daily (7 days a week, 365 days a year) and delivers them to the processing center of the NHDOT's bank. Additionally, the armored car service delivers to each toll plaza change fund replenishment funds which have been processed and packaged by the bank.

Each day, the money processing vendor will provide electronic files with money bag count data associated with money bag numbers. The Host Computer will import these files and

associate the counts with the appropriate attendant and vault tours based on the uniquely bar coded money bag numbers. Any errors from this import will result in an alert message and generation of an error file. Any money bag numbers not recognized by the TCS Host Computer will be imported into the system and will be available on the system reports but will not be associated with particular tours unless manual adjustments and associations are made.

Data from the money processing vendor will also include any adjustment information that arises as a result of the final bank deposit being different from the sum of the individual bag counts. This information shall also be imported into the system and shall be available on the appropriate screens and reports.

NHDOT will provide the Contractor with the money counts file format.

C-3.8.7. Interface with Bank

By contract between the Toll Revenue Processing Vendor ("Processing Vendor") and the State of New Hampshire Department of Transportation, Bureau of Turnpikes, the processing vendor picks up, sorts, counts, and deposits and reports back to the State the revenues contained in all money bags.

An armored car service collects all of the money bags held at the toll plazas daily (7 days a week, 365 days a year) and delivers them to the processing center of the "Processing Vendor". Additionally, they deliver to each toll plaza change fund replenishment funds ("Returns") which have been processed and packaged by the "Processing Vendor".

The "Processing Vendor" will process the moneybags that are collected each day. Information regarding the counts of these moneybags will be recorded in the Processing Vendor's Glory System and they will produce a three-volume set of files for each revenue day. Each set will contain a Revenue file, an Adjustment file, and a Return file in a file format standard to the Processing Vendor's "Glory" processing system. The "Processing Vendor" will post these files on a FTP site.

The TCS Host Computer shall check this FTP site every hour, and download any new files as they are discovered. The Host computer will import these files and associate the counts with the appropriate attendants and vault tours based on the uniquely bar coded money bag numbers. Any errors from this import will result in an alert message and generation of an error file. Any money bag numbers not recognized by the TCS Host Computer will be imported into the system reports but will not be associated with particular tours unless manual adjustments and associations are made. The host software shall not allow any bags to be overwritten should a duplicate bag number be processed.

Data from the "Processing Vendor" will also include any adjustments information that arises as a result of the final bank deposit being different from the sum of the individual bag

counts. This information shall also be imported into the system and shall be available on the appropriate screens and reports.

NHDOT will provide the contractor with the money counts within the "Glory" system file formats.

The NHDOT/Turnpikes receives summary deposit information and detailed bag counts. Turnpikes funds on deposit at the Processing Vendor are managed by the New Hampshire State Treasury.

The revenues delivered to the "Processing Vendor" are not pre-counted as is customary for the banking system. The Bureau of Turnpikes does not provide totals. The "Processing Vendor" counts the bags and deposits are credited into the Turnpikes account. Via an electronic data file, the bank reports back to the Bureau of Turnpikes, the contents of each money bag. The information in these files shall be used to reconcile monies turned in by attendants during their TOD's. The "Processing Vendor" also completes deposit confirmations, adjustments and summary reports which are sent to the Bureau of Turnpikes administration via a secured email and/or fax. Interface With Other DOT Systems

The Host Computer will interface to the DOT Authentication server to authenticate access to the server resources. The Host Computer will interface with the DOT Exchange Server SMTP service for sending of MOMS maintenance messages as well as for sending and receiving e-mail messages. Additionally the TCS Host shall also interface with the DoIT's virus protection software.

C-3.8.8. WAN Monitoring

The plaza system shall have a primary link to the TCS Host via VPN over a broadband Internet connection. The plaza system shall have a secondary link to the host via dial up connection, which will be manually enabled when the primary link goes down. The MOMS Host component will monitor communications to each plaza system and report the loss of communications:

- The host system will detect and report to MOMS when the primary connection goes down.
- The host system will detect and report to MOMS when the secondary link is established.
- The host system will detect and report to MOMS when the primary link is restored.

C-3.8.9. Time Synchronization

The host computer system will be provided with a real-time clock and calendar. The performance requirements for the clock are:

- Clock Resolution of 1/60 second
- Automatic date correction to compensate for 28, 29, 30 and 31 day months.
- Correctly handling the time change and placing traffic data in the right file automatically.
- Clock Accuracy of ± 5 seconds per month.
- A rechargeable battery that will last at least one month will back-up the clock.

The host computer system will operate normally, without any failure or loss of data, when the system clock is reset.

The host servers, plaza workstations, lane controllers and any applicable field device will all be synchronized with the NHDOT primary domain controller using the XP Internet time function.

C-3.8.10. Canadian Exchange Rates

The TCS shall allow for the entry of a Canadian exchange rate. The system will utilize the exchange rate in the following way:

- Calculate the change due in US currency for toll payments made in Canadian Bills.
- Identify the revenue date in which the system will start applying the new exchange rate.

The new exchange rate shall become effective at midnight of the date it is set to be active.

The system shall show historical exchange rates to allow authorized users to check that all revenue-day exchange rates have been correctly entered into the system.

C-3.8.11. Vault Switch Amount

The TCS shall allow NHDOT to modify the vault switch weight (calculated by the number of coins), which triggers the lane system to switch to the next vault when the active vault reaches the pre-determined threshold. The data field for the vault switch weight shall include an entry for the revenue date in which the system will start applying the new weight definition. The new weight definition shall become effective at midnight for the date it is set to be active.

The system shall show historical weight definitions to allow authorized users to check that previously entered weight definitions have been correctly entered to the system.

C-3.8.12. Bank Deposit Tracking

The TCS shall allow for entry of bank deposit adjustment information that has been received from the bank. A daily physical count of cash at Loomis is taken after all the

moneybags have been run through the currency and coin machines. If there is a difference between the physical count and the aggregate machine count, an adjustment shall be granted. This bank deposit adjustment data shall not affect revenue reports.

The system shall allow for the audit staff to assign the above deposit adjustment to an attendant, ACM vault or plaza.

C-3.8.13. Unpaid Toll Tracking

The TCS shall provide a No-Funds report that shows the unique numbers of the No-Funds documents issued at the lanes to patrons that did not have funds to pay the toll.

This report shall be exported as a Comma Separated Value (CSV) file, which the NHDOT will then manage externally.

It is Turnpikes' practice to download the daily reports into an Excel spreadsheet. Two columns for an administration fee and total due are added to the spreadsheet and it is exported into a database. The database is used to track accounts receivable.

After the database has been updated with the daily no-fund transactions, the Supervisors or shift leaders enter names and addresses and license plate info into each record. When payments are made, the amount paid is entered into the record. The transaction ID identifies which record to update.

C-3.8.14. Version Tracking Requirements

The Host System shall maintain records (not the actual files) of all versions of the Transponder status list; toll rates and schedules; lane configuration files, and lane executables that it received and/or created and that were successfully downloaded to the lanes over the past six months on a rolling schedule or as determined in design and Approved by the NHDOT. Receipt of files from and transfer of files to the ORT Host and the E-ZPass CSC/VPC, their version, time of receipt and processing status shall also be tracked. Reports and a GUI shall be made available to verify the versions and the download status. Failure in the transmission of any data to a lane or the back office system (ORT Host System or E-ZPass CSC/VPC) shall result in a failure message being logged and reported to the MOMS.

C-3.8.15. Revenue Day Assignment and Verification

It is critical that all messages from the lane controllers are transmitted to the Plaza/Host System and a verification of this data transmission shall be performed. The Contractor shall provide this validation which, if successful, closes the Revenue Day. If the validation process fails for any reason, failure messages shall be created and reports shall be made available to authorized personnel. If the Revenue Day process determines that transactions are missing, the missing sequence number shall be identified and reported. The System shall allow for the manual closure of a Revenue Day and all such manual

closures shall be flagged and reported. Reconciliation of transactions and revenue is performed on a Revenue Day basis.

The current revenue day is from 11:45:00 PM to 11:44:59 PM.

C-3.8.16. Data Summarization

In order to support the NHDOT reporting requirements and control the size of the database, all pertinent financial and transactional data shall be summarized. The availability of detailed data and the summarization of data shall be in accordance with the data backup and retention requirements, herein.

C-3.8.17. Diagnostics

The Host System shall provide self-diagnosis functions to detect and report on the status and functioning condition of the Host System hardware devices; communications; processes; tasks, and software applications, as defined in the NHDOT-Approved Design Document. All failures detected shall be reported to the MOMS.

C-3.8.18. Data Security

The Contractor shall ensure that master data records, once entered into the System, cannot be deleted or changed. Master data records and files shall only be appended to and not edited or deleted. If manual intervention is required only authorized users with proper security access shall be permitted to 'flag' a file to ensure the integrity and provide a complete audit trail. All System access/entry, logins, and modifications (i.e. flagging actions) shall be recorded. Encryption shall be used for all confidential data.

C-3.8.19. Transaction Pre-Processing

The Host System shall ensure all transactions transmitted to the E-ZPass CSC/VPC are transactions that comply with the existing ICD specifications and can be correctly posted to an account or can be pursued as a violation. Transactions that cannot be processed further at the CSC/VPC shall be identified and flagged and shall then be transmitted to the E-ZPass CSC/VPC. If duplicate transactions are not filtered at the lane controller then the Host System shall perform such filtering. In cases where a Transponder read and an Violation are created for a vehicle (in case of buffered reads or lane logic issues) then the Host System shall perform the filtering based upon configurable parameters approved during the Design phase. In case of buffered read transactions, the Transponder read time shall be used as the transaction time. Alarm messages shall be created and reported to the MOMS in the event such exceptions exceed a configurable threshold.

C-3.8.20. Fare Calculation

Currently the NHDOT determines the fare charged at each barrier tolling plaza based on the vehicle classification.

C-3.8.21. Real-Time Monitoring

The Contractor shall provide the capability to monitor the real-time activity at all TCS System tolling locations in a pictorial and Dashboard view. Users shall have access to the detailed data directly from the pictorial and Dashboard view. Users shall be able to easily maneuver through screens and view data, and different colors and pictures shall be used to bring critical events to the user's attention. Summary data by payment type for the entire roadway and by tolling location shall be displayed and users shall have the ability to drill down to the details. If a specific tolling location is selected, transaction and event level data by lane shall be made available through this screen. Users shall be able to easily identify problems (traffic or equipment) on the toll lanes. In addition, the real-time monitoring shall provide detailed real-time information about the AVI system performance, the AVDC system performance, and the VES performance to assist in diagnosing and investigating problems. Data pertinent to traffic monitoring, dynamic pricing, and maintenance shall be displayed in real-time.

C-3.8.22. User Setup and Maintenance Screen

User setup and maintenance is a critical task since the employee access levels/roles created through the System shall determine what privileges and access rights each employee and or role is granted. Access to Host System and the MOMS application shall be controlled through this interface. Authorized personnel shall have the ability to create new users through the System. Through a user setup and maintenance screen, the users shall be designated various access levels/roles based on their responsibilities (job description). In the Design phase access levels/roles shall be created and the System shall allow the input and editing of generic job access levels/roles. The access rights of each role and the ability to add roles and users shall be defined by the NHDOT during the Design phase.

The user setup and maintenance screen shall be also used to activate and inactivate employees from the System. The same screen shall also be used to assign User ID and PIN/password for access to TCS applications per DoIT requirements. As soon as the information is saved, an access control list shall be transmitted in near real-time to the various Systems for immediate user access.

C-3.8.23. Upload Verification of Transaction Records

The host computer shall have the capability of receiving transaction records from all lane controllers and verifying the completeness of transaction record data. Any "breaks" in transaction records or missing of transaction record data shall be identified, searched for (or polled) and replaced by the host computer from data storage in the lane controllers. A listing of any missing sequences in transaction numbers or loss of required transaction record data shall be maintained in the maintenance monitoring system and an Audit Reconciliation file.

All lane transaction records shall be stored in a manner where it shall be available at the plaza site for local processing and report generation and uploading to the CSC. The host computer shall coordinate and log all communications from the lane controllers and to the CSC.

The lane controller shall have the capability to temporarily store transaction records in the event of a communication outage between the lanes and the host, but shall normally transmit records to the host computer system in a real-time mode. The lane controller will be able to surrender the lane data either through a portable computer or high-density removable disk.

The Host computer system shall have the capability to store 60 days of transaction records from all lanes in the event of a communication outage between the Host computer system and the CSC. The transaction records shall also be removable and transportable. Provision shall be made to transport the transactions from host computer to CSC on a portable computer or removable storage media in the event of a communication interruption.

Transaction records shall be received from lane controllers, verified, and stored in a database. After successful verification and testing, transaction records remain in the circular storage in the lane controller until overwritten. Transaction records shall ultimately be recorded at the host level, but copies of the transaction records shall remain available on the host computer until no longer needed (Toll Audit, revenue posting, etc.).

The host computer system shall be part of the system LAN in the plaza building.

C-3.8.24. Download Account Status Data, Toll Rate Table, and Time Synchronization

The Host computer shall receive periodic file updates of E-ZPass transponder account status from the CSC. The Host computer shall store the most recent version of this file and maintaining a log of the time and date of the file receipt. The host computer shall thereupon update/replace the transponder status stored in each lane controller. Lane controllers shall immediately begin using the new file. The lane controllers need not maintain the previous editions of the transponder status listings.

Toll Rate Table update shall include the date and time the update is to take effect and the new fares for each class. The toll rate schedule shall be stored so that the NHDOT can easily modify changes to the existing schedule. The system will maintain a log of toll rate changes.

Any adjustments or increases to the current schedule the system shall be capable of accepting a maximum of fifteen (15) additional rates per vehicle class. The toll rate schedule(s) shall also take into consideration and be established in accordance with the current IAG classification structure as well.

The TCS Host shall be synchronized to a certified source Approved by the NHDOT using standard network time protocol (NTP) at configurable intervals but at a minimum every five (5) minutes. The lane controllers; AVI systems; AVDC systems; VES; and other servers needed to support the requirements of this document shall be synchronized to the TCS Host System or Approved certified source. If needed, synchronization messages shall be sent to devices that do not support off-the-shelf time synchronization software. All servers and controllers shall have a primary and secondary source for synchronizing time. The time synchronization technique shall ensure that there are no transactions or files with incorrect time stamps.

C-3.8.25. Audit and Reconciliation

Reconciliation is a calculation that shows how one balance or figure is systematically derived from another. The purpose of reconciliation is to explain the difference between two items. The principal data comparison and reconciliation activity is performed via the toll collector shift reconciliation analysis. Basically, two types of data are reconciled. These are vehicle counts by class and collection receipts.

Vehicle reconciliation for a manual lane uses the toll collector classifications to determine the total number of vehicles by class classified during a shift. This number of calculated vehicles by class is compared to AVDC vehicle counts by class (recorded during the shift). If there are no unusual occurrences, the two totals should match and the vehicles would be reconciled.

Next, collections shall be reconciled. The system shall count the number of vehicles of each class during the toll collector's shift, excluding those that have paid by E-ZPass. Vehicle counts for each class when multiplied by their respective toll class and added together constitute the system measurement of the cash that was collected.

As part of the audit process, the toll collector counts and enters the funds collected during the shift through the toll collector's workstation. The comparison between the toll collector's deposit report, the count of the toll collector's deposit in the cash room, and the funds indicated by the toll collector's classifications are reviewed and evaluated by toll audit.

In a mixed mode lane, E-ZPass or cash transaction records shall be separately accounted for in order to determine the deposit amount to be expected from a toll collector.

E-ZPass transaction reconciliation compares vehicle reads (valid and invalid) and "no-reads" not processed by a toll collector with independent lane sensors.

Daily lane reconciliation shall account for the toll period and be tabulated by vehicle counts, vehicle classifications and axle counts by cash payment types and exceptions/violations. Shift or period totals will also be provided.

C-3.8.26. General Reports

Screens and Report Access

Capability shall be provided to assign privileges and access rights, as determined by the NHDOT, to the TCS Host System application. Based on the access levels/role a user is assigned to the appropriate menus, screens, tabs, reports and all other required user information shall be displayed. For some screens, certain access levels/roles may only be allowed to view the contents and not allowed to enter any data. Access privileges shall be set up to allow NHDOT authorized personnel to make changes to the access privileges at any time, and shall be based upon access level/role and not at an individual employee basis.

Toll Collection System Screens/Reports

All data entered or generated in the System shall be retrievable through reports and screens. Reports and screens shall be made available through the System and on an ad-hoc basis; shall have various selection and sort criteria, and shall be easily configurable. The location selection criteria shall include plaza, lane, and direction of travel. The date selection criteria shall include but are not limited to the ability to generate the same report by hour; day; date range; weekly; monthly; yearly, and year-to-date. Data shall be presented as an accumulation or individually for the selected criteria. This capability shall be configurable and applicable to individual tolling location and different transaction types whereby the user can choose the data to be presented as an accumulation of tolling locations and/or payment types or as individual tolling locations and/or payment types. Capability shall be provided to manipulate the report data to perform comparative analysis and statistical calculations. The Contractor shall provide ad-hoc reporting tools and use of the tools to generate ad-hoc reports shall be documented. Ad-hoc report templates created by authorized users shall be made available to all authorized users. In addition to the reports listed below, the Contractor shall provide fifteen (15) additional report formats to be determined during the contract.

All reports shall show the status of the Revenue Day, as defined by the NHDOT and other relevant statuses that indicate items including but not limited to whether all data has been obtained from the lanes; the transactions have been transmitted from ORT Host System or the CSC/VPC; the report is complete, and if audit can begin. Additionally, the time of the last transaction processed shall be included in all applicable reports. All reports shall include individual totals, sub-totals, and grand-totals as appropriate. Reports shall be configurable based upon "process date," "transaction date," or both, as designated by the NHDOT. Transactions generated during Maintenance modes shall not be included in revenue and traffic reports. Separate reports shall be made available to report Maintenance mode transactions.

All reports and screens shall have the capability to be printed; saved in .pdf format; html format; xml format; rtf format; Access and Excel formats (latest version of Microsoft Office utilized by NHDOT), and other formats to be Approved during the Design phase. Selected reports shall be automatically generated and made available to authorized personnel at the start of the Revenue Day or at other appropriate time as designated or requested by the NHDOT. A report generation feature shall be available for configuration and shall permit an individual with permission to request selected reports for auto delivery by email or to a designated drive folder according to a routine or custom-specific interval. The System shall have the ability to drill down all high-level reports to the next level of detail and to details as required. Additionally, the user shall have the ability to display and review the violation images and event details associated with the selected transaction from the drilled down details.

Authorized personnel shall also have the ability to view the contents of files that are received by and/or transmitted by the Host System in a readable format. If files are compressed or encrypted, the necessary software tools shall be provided to view their contents. If the user selects a specific file, the contents of the file shall be displayed and the user shall have the ability to save the contents as a .csv file and in Excel format.

Where applicable, data shall also be presented in a graph forms and chart types and the user shall be able to select presentation form from a variety of graphic styles. Report designs shall be presented and finalized during the Design phase. Data shall be organized and summarized in manner to allow for report generation within no more than two (2) seconds for daily reports, and no more than twenty (20) seconds for monthly and annual reports, of a report generation request. Additionally, after the Implementation of the System, the need may arise to create additional reports and modify implemented reports and the Contractor shall support such additions and/or modifications.

Host Reports

The reports required to audit and reconcile the TCS Host System are listed below in this section. The System shall be capable of generating several categories of reports that have the capability for drill down including, but not limited to

C-3.8.26.1.1. Collector Reports

C-3.8.26.1.1.1. Collector Segment of Duty (SOD) Report

The SOD Report shall present a summary of collector activity during a single SOD. Each SOD Report shall include collector name, collector ID, plaza, lane, SOD start time, SOD end time and report generation time and date. Each SOD Report shall include the following summary of activities.

- Transaction summary by class by method of payment including totals, adjusted transactions and adjusted total;

- Axle summary by class by method of payment including totals, adjusted axles and adjusted total;
- Expected revenue summary categorized by class by method of payment including totals, adjusted revenue and adjusted total;
- Transaction adjustments (in-lane reclassifications); and
- In-lane alarms (equipment failure).
- Only one collector SOD Report shall be generated per page.

C-3.8.26.1.1.2. Collector Tour of Duty (TOD) Report

The TOD Report shall present a summary of collector activity during a single TOD. Each TOD Report shall include collector name, collector ID, TOD start time, TOD end time, associated money bags, cash out person, and report generation time and date. Each TOD Report shall include the following summary of activities:

- Transaction summary by class by method of payment including totals except E-ZPass transactions, adjusted transactions and adjusted total;
- Axle summary by class by method of payment including totals, adjusted axles and adjusted total;
- Expected revenue summary categorized by class by method of payment including unadjusted totals, adjusted revenue and adjusted total; and
- Transaction adjustments (in-lane reclassifications).

Only one collector TOD Report shall be generated per page.

C-3.8.26.1.1.3. Collector Exception Report

The Collector Exception Report shall present a summary of all collectors which have a variance exceeding an amount entered in the generation criteria. Each Exception Report shall list collectors in alphabetical order. Each collector listed shall include name, ID, TOD start time, TOD end time, cash deposit date and time, expected deposit, actual deposit, deposit adjustment, actual adjusted deposit and variance.

C-3.8.26.1.2. Revenue Reports

C-3.8.26.1.2.1. Violations Report

The Violations Report shall present a summary of the expected and adjusted violations for a specific time frame. Each Violations Report shall include lane, plaza, access to the images, expected revenue, actual revenue and variance, violation count by lane. Only one report shall be generated for each plaza.

C-3.8.26.1.2.2. Daily Bank Reconciliation by Process Date

The Daily Bank Reconciliation by Process Date Report shall present a reconciliation of all appropriate deposits for a specific revenue day based on the date in which reconciliation

processing took place. Report generation shall be defined based on revenue day, collector, lane, and plaza.

C-3.8.26.1.2.3. Daily Bank Reconciliation by Business Date

The Daily Bank Reconciliation by Business Date Report shall present a reconciliation report of all appropriate deposits for a specific revenue day based on the date in which the revenue was collected. Report generation shall be defined based on one or more of the following criteria:

- Revenue day;
- Collector;
- Bag numbers;
- TOD;
- TOD revenue date;
- Value of coins, dollars, Canadian money, and Canadian bank rate;
- Lane; and
- Plaza.

C-3.8.26.1.2.4. Daily Revenue by Plaza Report

The Daily Revenue by Plaza Report shall present a summary of all TODs excluding E-ZPass transactions on a daily basis for a single plaza. Each Daily Revenue by Plaza report shall include plaza, revenue day, TOD and collector name and ID, lanes worked, TOD expected revenue, actual deposit, adjusted revenue, adjusted total and variance.

C-3.8.26.1.2.5. Revenue by Plaza Report

The Year-to-Date Revenue by Plaza Report shall present a summary of the revenue collected between a given start date and a given end date. Each Year-to-Date Revenue by Plaza Report shall be broken into monthly totals each including expected revenue, total deposit, variance adjustments, adjusted revenue and expected E-ZPass revenue.

C-3.8.26.1.2.6. Daily Non-Revenue Report

The Daily Non-Revenue Report shall present a summary list of all non-revenue transactions for any specified day. Each Daily Non-Revenue report shall include E-ZPass transponder number, date/time of transaction, lane, plaza and vehicle class.

C-3.8.26.1.2.7. Unpaid Toll/Violation Detail Report

The Unpaid Toll/Violation Detailed Report shall present a summary of all unpaid or partial payment transactions for a specified time frame. Each Unpaid Toll/Violation Detailed Report shall include date/time of transaction, lane, plaza, patron license number, patron name, amount paid (if applicable), amount due and verification of payment.

C-3.8.26.1.3. E-ZPass Reports

C-3.8.26.1.3.1. E-ZPass Revenue by Plaza Report

The E-ZPass Revenue by Plaza Report shall present a summary of all E-ZPass transactions and expected E-ZPass revenue at all plazas or a specific location for a specific time frame. Each E-ZPass Revenue by Plaza Report shall include total transactions by plaza, lane, vehicle class for each lane, total for all classes and expected revenue.

C-3.8.26.1.3.2. E-ZPass Usage Report (single transponder)

The E-ZPass Usage Report (single transponder) shall present the total transaction usage for a specific transponder. Each E-ZPass Usage Report (single transponder) shall include transponder number, plaza, lane, transaction date/time, transaction transponder status and expected revenue for each transaction.

C-3.8.26.1.3.3. Daily Lane Operations Report

The Daily Lane Operations Report shall present a summary of lane openings and closings for a given time frame. Each Daily Lane Operations Report shall include plaza, lane, date/time opened, mode of operation, date/time closed, collector ID and name, and vault number if applicable.

C-3.8.26.1.4. Audit Reports

C-3.8.26.1.4.1. Axle Dollar Variance

The Axle Dollar Variance Report shows the variances for axles and deposits for a collector's tour of duty. The axle variance is the difference between the actual axles counted by the treadle and the expected axles based on the collector's classifications. The dollar variance is the difference between the collector's deposit and the expected revenue based on the classifications. The report provides insight into the performance of the collectors.

C-3.8.26.1.4.2. Audit Log

The Audit Log shall present a summary of adjustments made to vault or collector SOD's by an auditor for a given time frame. Each Audit Log shall include SOD open date/time, SOD close date/time, collector ID, Vault ID, total SOD transactions and indicated revenue. All entries shall be presented for both before adjustment and after adjustment. Additionally, the Audit Log shall include adjuster's number, amount adjusted, date/time of adjustment and review date, and any comment by adjuster.

C-3.8.26.1.4.3. Audit Entry Log

The Audit Entry Log Report displays manually entered data, such as collector deposits, vault deposits, adjustment entries, collector deposit corrections and vault deposit corrections. The report lists each deposit and adjustment/correction record for a specified date/time. Additionally, the user can narrow the amount of data reported by selecting an individual staff ID and/or transaction type.

C-3.8.26.1.4.4. Change Fund Audit

Available from the Audit Reports menu, the Change Fund Audit Report provides a summary of all change fund activity within the selected reporting period. This reporting period is based on the calendar date.

C-3.8.26.1.4.5. Detailed Audit

The Detailed Audit Report lists every transaction that occurred during the specified report time range. The Detailed Audit report provides insight into the performance of the lane and collector actions in the lane. The report includes full details for every transaction including but not limited to equipment states, alarms, and the serial number for unpaid toll transactions.

System Audit Reports: Weekly and monthly reports shall be made available that show the user access data and modifications made and ability shall be provided to obtain the details of the modifications.

C-3.8.26.1.5. Traffic Reports

C-3.8.26.1.5.1. Hourly Method of Payment Report

The Hourly Lane Traffic Report shall present a summary of all lane transactions for each hour of a specified time frame. Each Hourly Lane Traffic Report shall include plaza, lane, cash transaction by class, E-ZPass transactions by class, non-revenue transactions by class, violations by class and total transactions.

C-3.8.26.1.5.2. Hourly Lane Traffic by Lane Report

The Hourly Lane Traffic Report shall present a summary of all lane transactions for each hour of a specified time frame. Each Hourly Lane Traffic Report shall include plaza lane, and hourly breakout.

C-3.8.26.1.5.3. Traffic by Lane Report

The Traffic Report shall present a summary of all lane transactions by plaza, lane and class of a specified time frame.

C-3.8.26.1.5.4. Daily Traffic Overview Report

The Daily Traffic Overview Report shall present a summary of all transactions for a all plazas. The report shall include plaza, by autos cash , autos E-ZPass, total autos, %E-ZPass for Autos, trucks cash , trucks E-ZPass, total trucks, %E-ZPass for trucks, non-revenue vehicles, break out of all violations transactions (Type 1 and 3) total violations, % breakout of all types of violations, and total traffic.

C-3.8.26.1.5.5. Unusual Occurrence Report

The Unusual Occurrence Report shall present a summary of all unusual occurrences within a specified time frame. Each Unusual Occurrence Report shall include plaza, date of

occurrence, lane, method of payment, collector ID, collector name, description, expected revenue, actual revenue and total unusual occurrences for the plaza.

C-3.8.26.1.6. Revenue and Traffic Comparisons and Projections

C-3.8.26.1.6.1. Traffic and Revenue Report

The Traffic and Revenue Report shall present a summary comparison of transactions and revenue between the previous fiscal month/year and the current fiscal month/year. The report shall include plazas traffic by class, previous and current month, previous and current year, and the difference between the two and percentage and revenue (cash E-ZPass, violations) by month for each fiscal year selected, revenue difference and percent difference

C-3.8.26.1.6.2. Ranking Traffic Report

The Ranking Traffic Report ranks the plazas based on traffic through the plazas for the specified time frame also includes percentage base on total.

C-3.8.26.1.6.3. Ranking Revenue Report

The Ranking Revenue Report ranks the plazas based on revenue generate through the plazas for the specified time frame also includes percentage base on total.

C-3.8.26.1.7. Daily Plaza Report

C-3.8.26.1.7.1. Plazas Events

Chronological list of lane operational events and messages, by lane or by attendant within plazas for selected date range

C-3.8.26.1.7.2. Transactions Details

Chronological list of lane operational events and transactions, by lane or by attendant within a plazas for selected date range including transaction number, lane, transaction date and time, transaction type, degrade reason, class mismatch, axle forward/reverse, dual tire, vehicle speed/height/width, Class AVI,IAG/AVDC, tag agency/number/status, tag read time, fare AVI, AVDC, full, Expected

C-3.8.26.1.8. Transmission Reconciliation Reports

Yearly, quarterly, monthly, weekly, and daily reports that show AVI and Apparent Violation transaction transmission reconciliation for all of the tolling locations. These reports shall validate that all of the AVI and Apparent Violation transactions received from the lanes were transmitted from ORT Plaza/Host System to the Lane Host System or the CSC/VPC. Reports shall be available by revenue day and transmit day and transmit day reports shall show the files transmitted and acknowledged by the receiving system. .

C-3.8.26.1.9. Transponder File Transmission Report

The Transponder File Transmission reports shall show the status of the Transponder Status File transmissions to the Plaza/Host System and to all of the tolling locations/lanes. Time of receipt from the CSC/VPC, time of transmission to the tolling locations/lanes, and the status of the transmission shall be displayed.

C-3.8.26.1.10. Attendant Scheduling Report

The report will be populated from historic traffic traveled one year prior to the dates to be displayed. The days displayed should always be based on the same days the previous years (i.e. Mondays will always line up with the Monday from the previous year and Holidays will always line up with the previous year's Holiday).

Using a user-changeable amount of 350 vph, the report will automatically shade in the hours in each day's column that are suggested to be staffed. Three shades will be used: no color shading for a given hourly range means traffic a year ago was under 400 vph total (NB or SB), green shade means the traffic a year ago was between 400 and 900 vph, yellow shade means the traffic a year ago was between 901 and 1200 vph and red shade means traffic a year ago was over 1200 vph.

C-3.9. Host Technical Requirements

C-3.9.1. Host Server Hardware

The Contractor shall furnish and install a complete server configuration including storage, back-up library, and other hardware as needed to support the requirements of this RFP.

Server configurations shall include all cabinets and ancillary equipment to provide a complete and acceptable system that meets the Contract requirements. As required in this RFP, the server configurations shall have redundancy to support the TCS's availability requirements. Servers shall be specified, designed and configured to support disaster recovery procedures and ensure data security.

All servers, including all major hardware elements, shall be of the latest design and shall incorporate standard commercial products currently in production. The Contractor shall use proven server configurations that support future upgrades to processors, memory, storage, operating system, database, etc.

The Contractor shall furnish and install a complete Host System configuration at the John O. Morton Building and shall include all enclosures and ancillary equipment as may be necessary to provide a complete and acceptable server system. Coordination with DoIT will likely be required to determine available infrastructure.

The Contractor shall identify the configuration differences, if any, required for each of the two CSC/VPC interface options: Existing ORT Host System and the E-ZPass CSC/VPC. The

Host System server configuration shall be designed and implemented such that the Host Server shall be brought back on-line within five (5) day in the event of a catastrophic failure such as complete physical or functional loss of the TCS host. The Contractor shall provide Disaster Recovery procedures for the Host System that shall be implemented to ensure data security during a disaster. The Host System shall be capable of performing all functions described in these specifications.

Although not required the NHDOT Traffic Management Center (TMC) in Concord, NH may be used to house a secondary or back up TCS Host if the Contractor so chooses.

The Contractor shall ensure the Host System servers are sized appropriately to meet operational and traffic growth projections for the next ten (10) years. The Contractor shall use effective data storage techniques for the management of data. Users of the Host System shall experience no delays in generating reports or accessing the Host System for data.

The Contractor shall provide a storage subsystem and data storage strategy that allows for the HOT swap of failed hard drives and ensures that the failure of a single drive does not impair the operation of the system and does not require that the system be shut down to repair. Initially, the system shall have 200% of the disk capacity that is anticipated for the first five (5) years of operation.

C-3.9.2. Host Sever Operating System

The operating system for the Host System servers shall consist of a multi-user, multi-tasking operating system. The operating system shall support all peripherals defined in these specifications. The operating system shall also support the proposed communications architecture, redundant configuration, database software, and Contractor's application software. The Contractor shall obtain all licenses required in the name of the NHDOT. All licenses shall be provided to the NHDOT for all off-the-shelf operating system software, in addition to original software installation titles and media. The Contractor shall retain authorized copies (backups) for all software media to use for periodic System Maintenance, upgrades, or restore, as required. The proposed operating system should have a future upgrade path and must be supported for a minimum of five (5) years from the date of Provisional Final System Acceptance. The proposed operating system shall be covered under warranty during the Warranty Period.

The operating system shall be a proven system, used widely throughout the United States for intensive database operations, and should be compatible with the database and other web-based tools.

C-3.9.3. Host System Database

The Host System is a critical system that is directly linked to financial viability of the NHDOT TCS. NHDOT requires a high level of reliability and security from the database used for the storage of transaction data, toll collection management data, violation data, violator data, and all other data, as applicable, for the toll collection system. The Contractor shall use the latest database that is field-proven to operate in a transaction intensive environment. The database software shall be compatible with the operating system and application software, and shall support the TCS Lane/Plaza/Host System architecture. Appropriate licenses shall be provided to the NHDOT for all off-the-shelf database software. The proposed database software shall have warranty and Maintenance support services for the defined Warranty Period. The chosen database should have an upgrade path and should support upgrades to operating system, application, memory, disk drives, and processors.

C-3.9.4. Data Backup and Data Retention

Capability shall be provided by the Contractor to backup the Host System data on a daily basis without manual intervention, using tape/disk libraries or other media from which data can be retrieved. Notification on the status of the backup process shall be sent to the MOMS. Tools shall be provided to view the backup data in a user friendly and readable form. If there is a catastrophic failure that results in the loss of data, Contractor shall provide a means to retrieve the data without disruption to the Host operations. The Contractor shall provide a process that, at minimum stores a weekly full data back up at an offsite location. The following rules for data retention shall be followed by Contractor:

1. Transactions shall be retained on-line for a minimum of two (2) fiscal years plus the existing fiscal year on the TCS Host System and then archived to permanent long-term storage disk.
2. Summarized data shall be retained on-line on the Host System for at least ten (10) fiscal years plus the existing fiscal year.
3. System logs shall be retained on-line on the System for 120 days after which they are archived.
4. All other data shall be retained on the server for a minimum of two (2) fiscal years plus the existing fiscal year after which they are archived.
5. Images of Apparent Violations shall be retained on the Image Servers for seven (7) days if provided by the Contractor.

When the disk space utilization reaches 80% capacity, a message shall be transmitted to the MOMS. Data shall be deleted only after it is confirmed to be successfully archived. Any deletion of data shall be automatic, without user intervention, and shall generate a message to be transmitted to the MOMS.

The Host System servers shall be sized to accommodate the restoration of the archived data, if needed but such data shall not impact on-line data or reports. Users shall be able to generate queries from the restored data. Detailed disk sizing calculations shall be provided during the Design phase.

C-3.9.5. Data Migration

The Contractor shall provide full and complete migration of all legacy TCS data to the new TCS. Existing TCS data shall include, but not be limited to, the following elements:

- Detailed Cash & E-ZPass transaction records
- Summary level traffic and revenue reports
- Toll Collector Account Management Data
- Download and delivery history of tag status files
- Delivery and reconciliation history of transaction files to the CSC

Full and complete migration shall mean that all data, as identified and defined in the approved data migration plan, has been successfully transferred to the new system, has succeeded in all validation requirements, and is being processed by the new system without fault, failure, or discrepancy.

C-3.9.6. Migration Approach

As part of the Project Management Plan the Contractor shall provide a Data Migration Plan to describe how the migration team will perform and complete the data migration project. This Data Migration Plan shall explain, in detail, the various steps, including methodology, standards, and processes required to deliver a successful data migration.

Particular attention should be given to Quality Assurance and Control (QA/QC) within the approach description to ensure that each step of the process is integrated with quality processes or measures.

The Data Migration Plan shall also contain a detailed timeline of each event or task required to complete the data migration. The timeline should focus on identification of tasks, durations, resources, and dependencies (both internal and external) that may affect progress.

C-3.9.7. Migration Testing and Validation

Formal data migration testing shall be accomplished over two distinct steps including an initial Trial Migration Test and Full Migration Test.

The intent of the Trial Migration Test is to identify any anomalies, inconsistencies, or other problems with the adequacy of the data migration and test procedures. Trial Migration testing shall be performed using a full legacy database snapshot, but with validation focusing on a predetermined subset of data for efficient detail comparison. In the event of any script or test procedure issues, the Contractor shall address these items and retest.

Once Trial Migration testing has been performed to an acceptable level as determined by NHDOT, the Contractor shall then begin Full Migration testing. Under this phase, the same full legacy database snapshot will be used as with the Trial Migration test. However, focus shall be shifted to observing and recording the speed of execution, exercising the complete set of validation tasks, and identifying any remaining debugging efforts.

C-3.9.8. Implementation

Once both stages of migration testing have been successfully completed, the Contractor shall then begin the actual process of data migration from the legacy system to the new system. As part of the Data Migration Plan, the Contractor shall describe the implementation strategy by identifying each task or effort required. Identification of these efforts shall be provided in a comprehensive and tightly orchestrated document, with appropriate detail so as to minimize any potential for misunderstanding of the objective or directed intent. The Contractor shall also clearly identify the expected or required resources to complete each task in the Data Migration Plan. This may include personnel, equipment, technologies, or any other internal/external resource. A check list shall be developed and used to systematically verify that each indentified task is ready for migration.

As a supplement to the initial timeline provided as part of the Data Migration Plan, the Contractor shall prepare an updated detailed scheduled of events for completing the full data migration. The schedule shall also indicate any major milestones within the data migration process.

As the migration effort progresses, the Contractor shall document, track and prioritize any and all issues that may be encountered. This shall be in a punch list format. Resolution to any issue shall also be tracked within the punch list including reasons for failure/issue, steps taken to resolve the failure/issue, and scale of impact.

C-3.9.9. System Access

Access to the TCS System shall be via a Graphical User Interface (GUI) application or approved equal based on the current system access capabilities. Any new access shall

be browser based and any workstation connected to the TCS System network shall be able to access to the System application. Access to the application software shall not require the installation of any Contractor supplied application software on the workstations. Based on the user's access privileges the appropriate menus shall be made available. The NHDOT shall have any required licenses to use such applications in accordance with the same licensing arrangements as other parts of the ORT toll system and the TCS shall accommodate the ability to allow any and all NHDOT workstations to access the application. All usernames and complex passwords shall conform to the DoIT Standards, which will be available to the successful vendorr upon request.

C-3.9.10. Printers

The Contractor shall maintain any existing printing device. New printers shall be provided by DoIT or purchased through this contract with DoIT approval and installed by the Contractor with the ability to print to any printer connected to the TCS System network.

C-3.9.11. Communications Equipment

The TCS System will be interconnected by broadband cable models and dedicated leased communications lines per the current design. The Contractor shall work with the NHDOT during the design phase to complete the overall network architecture design and confirm available bandwidth capacities are adequate to support the TCS System. The Contractor shall coordinate with all NHDOT ISPs for communications trouble shooting. If the bandwidth of the existing network communications needs to be increased to support the transfer of TCS data and images, it is the responsibility of the Contractor to provide the improvements. All local area network (LAN) and wide area network (WAN) communications equipment shall be of the latest design and manufacture to support the TCS System. Network monitoring software shall be provided to monitor the TCS System network status and communications, including the connection to the NHDOT administrative office. All network alarms shall be reported to the MOMS. The Contractor shall coordinate with all of the existing NHDOT's Internet Service Providers.

C-3.10. Data and Anti-Virus Protection

The Contractor shall coordinate with DoIT to provide Data and Anti-virus Protection throughout the TCS. Note that DoIT currently uses McAfee anti-virus software products. NHDOT and DoIT shall review and approve Anti-Virus software for the following environments:

- Lane;
- Plaza/Host;
- Workstations;
- External system interfaces;

- Remote access locations; and
- Internet.

Data and Anti-Virus protection shall include, but not be limited to:

- Password data security at workstation login;
- Data backup subsystems;
- Boot record and memory virus scanning;
- Disk and tape virus scanning;
- Communication link and data packet scanning virus scanning; and
- Import and export file virus scanning prior to standard file opening and/or transfer.

The Contractor shall, at a minimum, provide the following:

- DoIT shall approve the method for maintaining and accessing updates from the current system;
- The latest version of Anti-Virus per DoIT approval;
- provide update service for the virus dictionary and/or virus scanning software throughout the initial warranty, maintenance and any optional maintenance periods; and
- The System shall accommodate Anti-Virus Operational procedures for daily updates "Pushed" out by DoIT servers to the servers and lane controllers on the TCS network.

C-3.11. Digital Video Audit System (DVAS) – OPTIONAL

The Contractor shall provide a DVAS solution as an option to the New TCS and this RFP. The New TCS shall be designed to allow a DVAS to be added either as a current or future option. Any pricing differences shall be so indicated in the Contractor's proposal. NHDOT requests that the Contractor provide separate pricing for the six (6) toll plazas (Hampton Main, Hampton Side, Dover, Rochester, Hooksett Main, Bedford) of the NHDOT toll system in detail containing unit pricing by lane, component, installation and any civil work.

The DVAS shall perform video surveillance on the down-traffic side of plazas all lanes within the NHDOT's turnpike system. DVAS shall capture live video images, archive and recall video image records that will correlate with the toll transactions as they occur in the lanes. The DVAS is intended to provide the NHDOT's audit staff with the capability to review video in time synchronization with a toll transaction. The DVAS shall be designed to operate on a continuous availability basis, 24 hours per day, 7 days per week 365 days per year and as such must be maintained with the same rigor as the TCS.

DVAS should not be confused with the VES or vehicle recognition systems that utilize optical character or image recognition to determine vehicle license plate or vehicle profile data.

The Contractor is encouraged to furnish integrated video solutions incorporating VES that may achieve economies in system design and maintenance.

C-3.11.1. DVAS Architecture and Network Video Management Server

The DVAS shall be integrated over the NHDOT network having access to the TCS Toll Host transaction database. The DVAS Network Video Management System shall provide video image storage and recall (via Hard Drive Array) that will support near real time retrieval for up to 60 days and archiving of video greater than 60 days for up to one year.

The images are time synchronized with the toll collection data for the appropriate toll lane location. A typical integrated Audit and DVAS application would a screen/interface where the user would be able to advance through multiple images that correspond to the transaction information below it.

C-3.11.2. DVAS Cameras

Each DVAS camera shall produce a digital image with an adjustable field of view (FOV) that is wide enough to visually see three lanes of traffic with sufficient image quality that will enable the user to identify the visual characteristic of the vehicle, including dual-tire vehicles at night. The DVAS camera connectivity shall be IP based having an Ethernet type connection capable of supporting fiber optic transmission if necessary. The design and quality of the DVAS camera is critical and shall provide images of sufficient resolution and clarity in all weather and lighting conditions. The DVAS camera shall be capable of rendering images in both color and black and white. DVAS camera housing shall be weather tight meeting specification IP66.

C-3.11.3. DVAS Audit Application

Toll audit shall be supported by the DVAS Audit Application where video images can be viewed in near real time as they are recorded or later in time from anywhere within the NHDOT's LAN or across the WAN. The Audit Application shall be browser based and have an integrated display that combines playable video images of actual traffic (from DVAS) with data from corresponding toll transactions or lane events. The Audit Application will make it possible for the user to zoom in on an image to determine the type of vehicle or transaction that occurred. Users may access the corresponding video image by inquiry using a transaction number, or transaction date and time, or any unusual occurrence event associated with a toll transaction.

The Contractor shall provide user training on the DVAS Audit Application.

C-3.12. Standalone Capabilities

The Contractor shall maintain the existing TCS and design the New TCS to ensure that all computer systems or servers shall store all data, image files, log files and transaction data for a minimum of sixty (60) days in the event of loss of network connectivity or data communications.

C-3.12.1. Lane

The Contractor shall ensure that the TCS design for lane level equipment and Lane Controllers; will support standalone operations and the storage media shall be sized to hold a minimum of thirty (30) days of data, images, transactions, status messages, violations data per lane at each of the tolling locations under normal operating conditions.

Upon re-establishing communications with the applicable plaza or host server or existing plaza/host computer, all back-logged, cached messages, data files and other events shall be transmitted to the each of the servers without affecting the real time operations or degrading lane operations. If any downloads, uploads or file transfers were interrupted prior to completion, then these files shall be re-transmitted to their destination to bring it up to-date.

C-3.12.2. Plaza

The Contractor shall ensure that the TCS design for VES/Image Capture and DVAS Servers will support standalone operations and the storage media shall be sized to hold a minimum of sixty (60) days of data, images, transactions, status messages, violations data per lane at each of the tolling locations under normal operating conditions.

C-3.12.3. Host

The new TCS Host shall be capable of standalone operation in the event that communications with any of the TCS subsystems or the CSC is degraded or lost. Transaction files to be sent to the CSC by the Host shall be created and stored for a period of sixty (60) days. Upon restoration of communications, the Host shall send the Transaction files to the CSC and generate a report to track/audit what was sent.

C-3.13. Power Backup (UPS)

As part of the phase in approach to replace existing hardware the Contractor shall provide a solution to consolidate the multiple uninterruptible power supplies located in the tunnel of each toll plaza, or a mutually agreeable location. Any new proposed UPS design shall accommodate a minimum up-time of no less than thirty (30) minutes.

C-3.14. Maintenance On-Line Management System (MOMS)

The Contractor shall provide an automated Maintenance On-Line Management System (MOMS). MOMS shall be a fully integrated with the TCS to monitor the status of operational equipment in real time. MOMS may be part of the TCS/Host System application software, or implemented as a separate application.

MOMS , records equipment and process failures, for reporting and tracking alarm messages and maintaining status, notifies maintenance personnel, logs acknowledgements, generates and tracks service orders, maintain Preventative Maintenance schedules, generates repair history, and maintains parts inventory and asset management.

The Agency shall have the ability to configure the priority level of each alarm and assign and change the escalation attributes. Addition of alarms shall not require any changes to the MOMS and the Agency shall have the ability to indicate if an alarm should result in the generation of a work order and if an alarm should be considered in performance reporting.

The MOMS shall meet the requirements needed to support the maintenance operations as specified in this RFP. The MOMS shall support real-time paging of maintenance staff and shall be configurable to meet the NHDOT operations requirements.

The MOMS shall have the ability to create manual work orders in events where one was not automatically created. The MOMS shall have the ability to determine response times, repair times, and lane down time from the data entered by the maintenance technician.

The MOMS can reside on the TCS Plaza/Host System server or a separate server can be provided. If the separate server is provided, it shall meet the general hardware requirements set forth in this document. Authorized personnel shall have the ability to generate various operational, management and performance reports from the MOMS, including:

1. Summarized and Detailed Alarm History;
2. Maintenance Paging and Response History;
3. Work Order Status;
4. Equipment Inventory;
5. Equipment Changes in Availability and Status;
6. Total System Availability;
7. Preventive Maintenance;

8. Corrective Maintenance;
9. Response and Repair Times;
10. Tolling Location Operational Status;
11. Equipment Use History;
12. Equipment Repair History;
13. Equipment versions, software versions, firmware versions and serial numbers for all equipment installed for the TCS or related Enhancements to the existing toll system;
14. Component failure trend analysis; and
15. Incident Logs and Lost Revenue Estimates.

The Contractor shall work with the NHDOT in configuring the MOMS to meet the NHDOT maintenance needs as further detailed in this document.

C-3.14.1. Maintenance On-line Management System (MOMS) Administration

Scheduling of all preventive and predictive maintenance activities shall be performed through the MOMS and automatic work orders shall be generated at the scheduled times.

C-3.14.2. Failure/Malfunction Reporting

The MOMS shall be capable of reporting and tracking alarm messages and maintaining status, location, health, and attributes for all hardware, networks, and software procured, developed, furnished, and installed. All failures and alarms shall result in the creation of work orders and depending on the work order priority, the MOMS shall notify Maintenance staff electronically in real-time. The Agency shall have the ability to configure the priority level of each alarm and assign and change the escalation attributes. Addition of alarms shall not require any changes to the MOMS and the Agency shall have the ability to indicate if an alarm should result in the generation of a work order and if an alarm should be considered in performance reporting.

Maintenance staff shall have the ability to create work orders manually, enter data regarding the Maintenance status and close work orders.

The MOMS shall allow for the possibility of generating, at a minimum, five (5) different types of work orders. The MOMS shall also provide for the capability to build ad-hoc work orders for unusual occurrences of maintenance activities. Work order formats and specifications shall be determined during the design process and approved in writing by the NHDOT prior to implementation. In addition, a work order shall include, but not be limited to, the following information regardless of its format:

- Date/Time of Work Order Generation;
- Date/Time/Location of repair or maintenance call;
- Work Order Number (sequential); and
- Failure or Malfunction description.

The MOMS shall allow for the automatic or manually activated paging of technicians once a work order has been generated. The notification method utilized shall be described in the proposal and shall be at the cost of the Contractor. The Contractor shall also provide details in the Maintenance Plan related to the escalation process of un-responded to events.

Maintenance staff shall be equipped with portable devices that allow them to access the MOMS, enter data remotely and completely manage work orders. The MOMS shall have the ability to determine and calculate initial acknowledgement times, response times (both remote access and on-site), repair times and lane and system down time from the data entered by the Maintenance technician. Equipment recovery messages shall also be reported through the MOMS.

C-3.14.3. Performance and Status Monitoring - Real Time Display and User Interface

As part of the MOMS, a performance monitoring application shall be provided which will, on a real-time basis, provide information regarding the status of all levels of toll system equipment and performance. The performance monitoring shall be accessible from any Host workstation and also from any plaza computer provided the proper clearance level has been entered. The performance monitoring function shall be developed in such a way as to allow the user to select and observe the status and/or performance of several predefined levels of the toll collection system. The following is a breakdown of the various levels, and, at a minimum, the degree of information required to be displayed for each level:

- Lane Level Components;
- All equipment status;
    - Status of all lane applications;
    - Lane ID/Type;
    - Lane Location (Plaza, Lane No.);
    - Current mode of operation (If applicable);
    - Lane Operation Status – Open, Closed, Degraded;
- Plaza Level;
    - Status of Lane/Plaza Communications Link;
    - Status of Plaza Computer applications;
- Host Level;
    - Status of Plaza/Host Communications Link; and
    - Status of Host applications.

In addition to the varying levels of monitoring, the MOMS shall allow for the real-time overview of lane activity based on plaza selection from the user. At a minimum, the real-time overview function should provide the following on-screen information.

- Lane ID;
- Collector ID (when applicable);
- Lane status (open/closed/degraded);
- Previous Vehicle Classification;
- Previous Vehicle Fare;
- Current Vehicle Classification; and
- Current Vehicle Fare.

C-3.14.4. Remote Access/Dial-Up Networking

MOMS shall be capable of providing remote access for maintenance and NHDOT personnel through either the LAN or WAN. Access shall be secured in accordance with NH DoIT security policies. Maintenance staff shall be equipped with portable devices that allow them to access the MOMS, enter data remotely and completely manage work orders.

C-3.14.5. Inventory/Spare Parts Control

A spare parts inventory of equipment shall be maintained and tracked by MOMS. When spare parts inventory reach a configurable threshold, automatic replenish alerts shall be generated. The MOMS will be capable of generating purchase requests and track delivery of all toll related equipment. Further the MOMS shall be capable of tracking and identifying such variables as part warranty status, install date, manufacture date, order amount, etc.

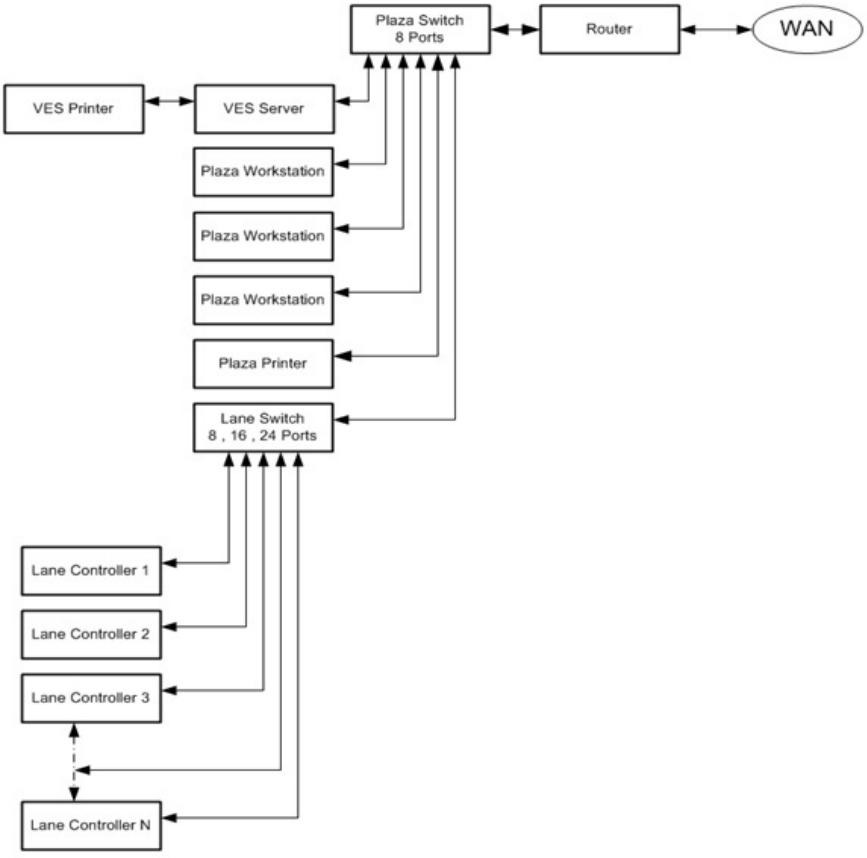
C-3.15. Communications Requirements

C-3.15.1. Lane to Plaza Communications

NHDOT intends that the current Lane and plaza communication infrastructure shall be retained and reused as part of the new TCS. The Contractor may propose an alternative or modified communications network if it deems the current design inadequate to support the desired functionality. Any anticipated modifications shall be clearly identified in the proposal.

The current lane/plaza network topography connects each lane controller to a single switch at the plaza. From there that switch is connected to a plaza switch connecting all other plaza equipment such as workstations and printers. The plaza switch is then connected to the WAN via a router. The following schematic represents the current lane/plaza communication configuration.

Figure 3-1 Default Plaza Network Configuration



C-3.15.2. Plaza to Host Communications

Currently the Plaza/Host communications is achieved through the use of broadband cable modems and T1 connections. Each plaza is serviced with a 1.5 Mbps download and a 512Kbps upload data rate. At selected plazas, service is currently provided by either Comcast, Metro-Cast or G4 public carriers. Utilizing the broadband internet connections, a VPN client connection is established and maintained between the TCS Host and each plaza. A VPN connection is also used for TCS Host to CSC/VPC Communications. The VPN server is located within the TCS Host to manage all connections.

C-3.15.3. Maintenance / Service

It shall be the Contractor's responsibility to both maintain the communications infrastructure and to coordinate with the various NHDOT's internet/data communications providers.

C-3.16. Environmental Requirements

C-3.16.1. Weatherproofing

The Contractor shall ensure that outdoor enclosures, cabinets, junction boxes and housings shall meet the environmental requirements above and have a rating of NEMA4X.

Camera and Luminaries shall have weatherproof corrosion resistant housings or enclosures with an IEC rating of IP65 or better.

Wire and cables that will be exposed to outdoor conditions shall be rated for outdoor use having a UV resistant jacket.

Outdoor connections and connectors shall be weatherproof; rated for outdoor use and resistant to UV exposure. Outdoor antenna connections shall be properly sealed using manufacturer recommended methods and materials.

All new enclosures shall be provided with appropriate access doors, closure panels, face panels, stabilizer kits, casters, mounting and installation hardware as may be necessary to provide a complete and operational installation of the TCS hardware. All interconnection and power cabling shall be provided as necessary and shall be installed to provide a professional look. Each enclosure front shall be enclosed with a tempered glass door and key lock to shield the Systems from dust. The enclosure designs shall consider the allowable space at the back office locations where the servers are to be installed. The enclosures, enclosure panels, and hardware described in this section and the proposed equipment layout shall be submitted to the NHDOT for Approval during the design process prior to purchase and installation.

All enclosures shall have, at a minimum, 25% of the capacity reserved for future expansion.

C-3.17. System Security

C-3.17.1. Data Security and Integrity

The Contractor shall ensure that master data records, once entered into the TCS, cannot be deleted or changed. Master data records and files shall only be appended to and not edited or deleted. If manual intervention is required only authorized users with proper security access shall be permitted to 'flag' a file to ensure the integrity and provide a complete audit trail. All TCS access/entry, logins, and modifications (i.e. flagging actions) shall be recorded. Encryption shall be used for all confidential data.

C-3.17.2. Computer Access Security

Access to all information on the toll collection system computer network shall be limited to authorized Agency, DoIT, and Contractor personnel only and shall be password controlled. User access security including sign-on facilities, permission control, and different levels of access shall be provided for the files, directories, and application software. The Agency and the Contractor shall develop the matrix of access levels during system design. The

system should allow for changes to the access levels and additions of personnel in a secure manner. The system administrator shall be able to view and update access levels via a graphical and easy to read table within the application software. Contractor shall not circumvent the system security as designed and as Approved by the Agency. Specific requirements shall be developed by the Contractor during System design.

C-3.17.3. Physical Security

Enclosure Access

Access to all toll collection enclosures shall be key/lock controlled. Access to the enclosures shall be recorded automatically and transmitted to the MOMS if applicable.

Toll Collection System Lock Requirements

All newly installed enclosures for the TCS shall be access controlled with removable and replaceable cylinder key/lock sets consistent with existing NHDOT's EMKA cabinet lock system.

The Contractor shall supply all locks, establish the keying index system for all toll collection enclosures and install these locks on all toll collection enclosures before installation.

The Agency shall issue all keys for all toll collection equipment locks. Contractor personnel shall utilize only assigned, individual keys, and shall not share keys with any other individuals, or make copies of any assigned keys. Contractor personnel shall immediately return all assigned keys to the Agency upon request.

C-3.18. TCS Performance Requirements

C-3.18.1. Accuracy Requirements

The new TCS shall meet the accuracy requirements described below.

Table 3-5 TCS Performance Requirements

Performance Requirement	Requirement Description	Performance Level
Accuracy Requirements	The Lane Controller shall correctly correlate all transaction data into a single transaction for each vehicle that passes through the toll lane.	≥ 99.95%
Transponder Read Accuracy	AVI shall correctly read all IAG tags that pass thru the E-ZPass lane	≥ 99.95%

Transponder Reporting Accuracy	AVI shall correctly record tag information for all tags that pass thru the E-ZPass lane	≥ 99.98%
Vehicle Detection Accuracy	AVDC shall correctly detect all vehicles that pass through the toll lane	≥ 99.9%
False Read Accuracy	Reporting an ETC tag read in a vehicle traveling in an adjacent non-AVI tolled lane or in a vehicle in the opposed direction of travel.	≤ 0.2%
Vehicle Classification Accuracy	AVDC shall correctly classify of all vehicles that pass through the toll lane	≥ 99.5%
Transponder Association Accuracy	The Lane Controller shall correctly correlate all transaction data into a single transaction for each vehicle that passes through the toll lane.	≥99.95%
Image Capture Reporting Accuracy	ICS shall capture at least one each front and rear human readable of license plate per vehicle for all vehicles that pass thru toll lane regardless of weather, lighting or vehicle position or speed	≥99%
Image Transmission Requirements	All AVI class mismatch and Apparent Violation images from the TCS shall be transmitted to the CSC/VPS with an accuracy of 100% under all conditions.	100%
Data Storage	New TCS Lane system shall be capable of storing at minimum 30 Calendar days of tag reads, vehicle, event and transaction data.	≥ 30 Days
Transaction Reporting Requirements	The NHDOT and/or its representative shall have access to all toll transaction data; maintenance and service records (TCS & MOMS) at all times for	≥99%

	review and audit.	
False Read Processing	Incorrect Violation Image Capture expressed as a percentage of vehicles carrying a properly mounted tag whose passage beneath the antenna results in the capture of a set of violation images.	≤0.2%
Automatic Coin Machine	ACM shall accurately collect the correct toll in the lane for each vehicle	≥99.5%
Availability	The New TCS (System) shall be available at least 99.9 of the time per month	≥ 99.9%

The Contractor shall validate compliance to the accuracy requirement by collecting data to the required sample size in live traffic operations as described below for each test. All times-of-day and traffic conditions shall be proportionally represented within the samples. The same sample of vehicles collected during live operations may be used for the verification of multiple accuracies, if applicable. Prior to the start of testing the System shall be confirmed to be fully operational. Transactions that fail to meet the requirements shall be reviewed and audited and anomalies investigated.

C-3.18.2. Mean-Time-Between-Failure (MTBF)

The TCS shall be required to meet specific minimum duration requirements for components and subsystems in continuous operation. This time requirement is defined as the Mean Time Between Failure (MTBF). The Contractor shall provide all third-party MTBF on individual components to be used in the System.

MTBF requirements for all components of the TCS shall meet the MTBF as specified below:

Table 3-6 Mean-Time-Between-Failure

Component or Subsystem	**MTBF (hours)**
Lane Controller	20,000
Automatic Vehicle Detection/Classification System (AVDCS)	8760

Component or Subsystem	MTBF (hours)
Violation Enforcement System (VES) Server	8760
Automatic Vehicle Identification (AVI) System	8760
TCS Host System	8760

The reliability of the System components shall be calculated based on the following MTBF calculation:

$$MTBF = \frac{\#\ Units * Test\ Period\ (Hours)}{\#\ Chargeable\ Failures}$$

Chargeable failures are defined in Section C-3.18.5.

C-3.18.3. Mean-Time-To-Respond/Repair (MTTRR)

The Contractor shall meet the required mean time to respond and repair (MTTRR). This requirement shall be measured for all deployed Sub-systems and Systems, in the time period being reviewed, and shall be averaged to determine if the Contractor has met the performance.

C-3.18.4. Availability

The Contractor shall meet availability requirements listed below:

Table 3-7 TCS Availability

Availability Requirements (Monthly)	
System or Subsystem	Availability Requirement (%)
Lane	99.5
Entire TCS	99.9

These availability requirements shall be separately calculated and applied as follows:

An available lane is defined as a lane with all of its subsystems properly functioning and available to collect revenue and send required transactions and messages, including associated transaction data, violation images, etc, to the TCS Host/IAG

CSC/VPC where applicable. A failure of the System, as defined below, shall not be included in the lane availability calculation.

An available TCS is defined as the entire TCS that includes the all components of the TCS that are properly functioning and available to collect revenue, receive data transmitted from the lanes and properly process and transmit the data to the Central Host System/ CSC/VPC. A failure of a lane shall not be included in the System availability calculation.

Calculation for Availability shall be the following calculation:

$$Total\ \%\ Availability = 100\% - \left[\frac{SystemAvailabiilty}{HoursSystemNotAvailable}\right]$$

C-3.18.5. Chargeable and Non-Chargeable Failures

For purposes of calculating MTBF and Availability performance requirements for testing and for Maintenance performance, chargeable and non-chargeable failures are defined as follows:

Chargeable Failures

Chargeable failures include any failures that are not specifically identified as non-chargeable including, but not limited to, the following:

1. A malfunction which prevents the TCS component (hardware or software) from performing its designated function, when used and operated under its intended operational and environmental conditions as detailed in this document.
2. A malfunction that poses a threat to the safety of the toll collection system components, toll collection system customers, employees or others.
3. An occurrence where data is not successfully transmitted between the lanes and the Plaza/Host System and from the ORT Host System to the CSC/VPC unless such failure is already accounted for as a separate performance failure (e.g., if the lane is not functioning and does not transmit data to the Plaza/Host System, the lane would be charged for the failure but the System would not).
4. A failure of equipment or software that allows revenue loss to occur on the TCS that is not already accounted for as a separate performance failure.
5. Software anomalies and bugs that affect the performance and operation of the TCS.
6. Shutdown or unavailability of the TCS unless specifically directed by the NHDOT.
7. Failure to properly register or report a transaction.
8. Failure to properly reconcile the toll collection system.
9. Failure to electronically send or receive transaction and payment information.

10. Failure to send required CSC/VPC ***E-ZPass*** transactions.
11. Failure to generate the reports required to reconcile and audit the System.
12. Failure to publish tag files to the lane controller and or lane subsystem.

Non-Chargeable Failures

Non chargeable failures shall include:

1. Force majeure, as defined in the applicable Contract Documents.
2. Vandalism.
3. Failure of a test facility or test instrumentation.
4. System component failures caused by externally applied stress conditions outside of the requirements of this document.
5. System component failures caused by environmental or operating conditions outside of the requirements of this document.
6. Normal operating adjustments as allowed in the Test Procedure or Maintenance Plan, as applicable.
7. Failures or accidents that are patron or user induced.

C-4. TCS INSTALLATION REQUIREMENTS

C-4.1. Installation Scope of Work and Requirements

The Contractor shall procure, install, terminate and test all equipment required as part of the new TCS as set forth in this document. The Contractor shall also procure, furnish, and install any new enclosures, conduits and or cable runs required to support the new TCS. Any required maintenance of traffic (MOT) and lane closures and shall meet the NH MOT specifications with regard to maintenance of traffic.

C-4.1.1. Installation and Construction Coordination and Meetings

Bi-Weekly Installation Meetings

The Contractor shall schedule and conduct bi-weekly installation meetings during the active installation phases (Phase IIB) of the project. The Contractor and any Subcontractors shall ensure that the appropriate personnel are present at these meetings, who can represent the Contractor's interest and provide the information necessary in a meaningful manner. The Contractor shall prepare and distribute a meeting agenda at least 24 hours prior to the scheduled meeting. The meeting agenda shall consist of those items pertaining to the installation and schedule for the previous and current week's installation efforts, as well as a two week forecasted schedule of activities. All issues that arose during the installation activity for the week shall be discussed and acted upon. At this meeting, the Contractor should also be prepared to address any issues or questions by the NHDOT. The Contractor shall document the meeting discussions and distribute the meeting documentation to the team. The Contractor shall also record and maintain an action items list that tracks all installation related issues.

Construction Coordination

As the primary efforts on the project are not expected to require any significant civil work the Contractor shall be prepared to coordinate if necessary with other NHDOT contractors. In the event of such need the Contractor shall coordinate closely with the NHDOT, and any other NHDOT Contractor in all aspects of the Project. The Contractor shall:

1. For any TCS equipment provided by the Contractor, provide all required Design and installation drawings, operating requirements and installation instructions to the NHDOT and its third party Contractors;
2. Review any third party Contractor provided drawings with respect to the TCS;
3. Approve all aspects of such drawings related to the toll system, and
4. Ensure the Contractor's needs necessary to meet the requirements set forth in this document are met with regard to such design. This includes responsibility for ensuring

that the locations, positions, installation, connections and other elements of the Contractor inputs identified on the design and installation drawings provided by the Contractor for all Contractors and NHDOT provided equipment, whether in-roadway, canopy mounted, or otherwise located, shall meet such requirements.

C-4.1.2. System Installation Requirements

The Contractor shall supply all personnel, tools, vehicles, materials and equipment required to perform the complete installation of the new TCS, including but not limited to all equipment and vehicles required for overhead canopy installation work; specialty equipment for preparation and saw-cutting of loops as required, and provide necessary test vehicles, cameras and equipment to adequately test the installed System in accordance with the Approved test plan.

Where the Contractor is providing subsystem components manufactured by a third party vendor, the Contractor shall ensure that all such components are installed in accordance with manufacturer's installation guidelines. In addition, Contractor shall provide such subsystem manufacturer on-site and remote support as is necessary to ensure the proper installation and operation of its equipment at no additional cost to the NHDOT.

The Installation scope of work includes but is not limited to:

1. Verify clean power to all toll collection equipment.
2. Where necessary furnish and install all connecting conduit from wire ways provided and installed by others and/or stub conduits to the equipment.
3. Verify, and install if necessary separate grounding for the TCS, surge protection devices (SPD), junction boxes, pull boxes, conduits, and other such items as required by the installation standards and requirements.
4. Where necessary furnish and install all wiring for all in-lane equipment and connections to the enclosures. This includes the proper termination of all power, communication, and RF cables and/or wiring (copper or fiber optic) required to connect the individual components into a fully operational TCS.
5. Furnish and install all equipment racks and enclosures required for the in-lane electronics, including environmental control devices and UPSs, as required.
6. Furnish and install all equipment brackets to support structures.
7. Furnish and install all electronics and other devices in their respective equipment racks and enclosures as required to provide a fully operational TCS.
8. Where necessary furnish and install the AVDC system equipment, including in-pavement sensors or overhead mounted equipment as specified. Includes all the

NHDOT Approved materials, equipment and supplies required for saw-cutting, wiring and sealing of wires in the roadway.

9. Install the AVI system equipment, including antennas, readers, related equipment, cables, and any support brackets required. All AVI mounting hardware, junction boxes, and cables shall be procured and supplied by the Contractor.

10. Furnish and install the VES equipment, including cameras, VES illumination, and any video controller equipment, sensors, software, controllers/servers, or specialty equipment associated with the VES.

11. Validate all cable and wire terminations via a test process to ensure that the cable is connected to the correct location on each end and that the cable/wire is properly terminated.

12. Power up and provide a field check out/installation Acceptance Test of all Systems, to be witnessed and approved by the NHDOT or its designated representative. Provide the completed installation checklist.

13. Where necessary tuning and testing of the AVI system, as described in, and in full accordance with, manufacturer's guidelines.

14. Calibration and testing of VES in full accordance with manufacturer's guidelines.

15. Where necessary, calibration and testing of AVDC system in full accordance with manufacturer's guidelines.

16. All other items, materials, and equipment to complete installation in accordance with this specification.

17. All other items, materials, and equipment to complete testing in accordance with this specification.

Installation Checklist

As part of the Installation Plan, the Contractor shall develop an installation checklist that tracks the progress and completion of all installation activities. The checklist shall be the document detailing those items required for the installation crew to complete the installation process for all equipment and components, including terminations and connections. A copy of the checklist signed and approved by the Contractor, attesting to the completeness of the installation, shall be provided to the NHDOT after the completion of the installation activities for each lane at each tolling location. The Contractor shall conduct a final inspection of all installations and certify the installation work.

C-4.1.3. Compliance to Standards

The Contractor shall adhere to all installation standards, applicable laws, ordinances and codes as required, including but not limited to NEC, the NHDOT, NHDOT, FHWA, IEEE and OSHA, for areas including but not limited to electrical codes, traffic control, seismic considerations, or environmental. All installations shall meet such requirements. The Contractor shall be responsible for all costs associated with any permits, plan reviews, and inspections. It shall also be the Contractor's responsibility to procure all documentation required to install and adhere to the proper installation standard, law, ordinance, or codes.

Relative to safety standards, the Contractor shall particularly note the NHDOT Standard Specifications 107.05 *Sanitary, Health and Safety Provisions* and 107.06 *Public Convenience and Safety*.

C-4.1.4. Electrical Work

Electrical work to be performed shall include, but not be limited to the following general items of work:

1. Provide and install surge protection devices as required to protect the TCS equipment and electronics.
2. Install junction boxes and terminate new cable and conduit attachment devices, where applicable.
3. For any new work, bond all conduits, manhole frames, metallic junction boxes, and other conductive items to the grounding system in conformance with the NHDOT and NHDOT Standard Specifications and the NEC.

All electrical work shall be performed in accordance with the applicable regulations. Appropriate NEC compliance shall be adhered to with all electrical articles for installation pertaining to wiring, enclosures, and other electrical equipment in hazardous locations. UL labels shall be provided for all electrical components.

All electrical equipment must be inspected prior to installation for defects that could damage the equipment or harm personnel. Any equipment found to have defects shall not be installed but shall instead be replaced with a fully functioning replacement.

All electrical equipment shall be properly grounded for safety. Refer to the following Section 4.1.4.1.7 Bonding, Grounding.

Electrical Requirements

All electrical material, equipment, wire, cable and components furnished by the Contractor shall meet all the applicable standards of ASTM, NEC, NEMA, IEEE, OSHA, FHWA and ASTM; shall be new, of the latest design and within twelve (12) months manufacture, in an operable condition at the time of installation. Equipment operation shall not be

affected by transient voltages, surges and sags normally experienced on commercial power lines.

The power requirements of the New TCS shall comply with all applicable industry regulations, codes, and safety requirements and shall follow best industrial practices. The Contractor shall submit to the NHDOT for approval a complete wiring diagram or drawing of the work to be done before installation of conduit or electrical equipment. The Contractor shall provide supporting calculations and documentation that indicate sufficient power available for all the equipment and that the storage capacity of the uninterrupted power supply (UPS) meets the minimum time requirements of 30 minutes of backup power.

C-4.1.4.1.1. Installation Requirements

The Contractor shall install the New TCS equipment and associated wiring in accordance with all industry standards, NEC, National and local building codes. All services by the Contractor will be performed in a workmanlike and professional manner by qualified and licensed personnel. The Contractor will be responsible for obtaining all necessary permits and approvals to perform all needed civil and electrical work at each facility. The Contractor shall not make final connections of the newly installed components to the existing system until receiving approval from NHDOT.

In the course of its work the Contractor notices or identifies any existing work or elements that may potentially be out of compliance they shall immediately notify the NHDOT. The NHDOT will work with the Contractor to determine what, if any, action may be required.

C-4.1.4.1.2. Mounting of Equipment, Conduit Attachment and Components

The Contractor shall provide surface mounting of equipment, conduit attachment and components according to the manufacturer's standard specifications. Mounting and fastening hardware components for stainless steel channel supports shall be stainless steel. Mounting and fastening hardware components for powder coated enclosures shall be stainless steel.

The Contractor shall use stainless steel mounting hardware such as bolts, nuts, washers, and external hinges on vaults, cabinets, shelters, junction boxes, and other devices. Surface mounting to concrete shall use stainless steel fasteners of sufficient size and penetration depth to support the load. The Contractor shall use only components designed for ten (10) or more years of industrial use.

C-4.1.4.1.3. Inspection

The NHDOT and or its representative(s) reserve the right to perform any necessary inspection of work for verification of any code or standard compliance.

C-4.1.4.1.4. Conduit

The Contractor shall provide conduit according to the following specifications:

Installation of conduit shall conform to appropriate articles of NEC and this section. In new conduits, electrical or low voltage signal conductors shall occupy a maximum of twenty-six (26) percent of the cross-section of the conduit. In existing conduits, conductor fill shall meet NEC requirements for conduit with three or more conductors, and shall occupy a maximum of forty (40) percent of the conduit's cross-sectional area. New conduit shall be supplied as a system matching existing conduit in place; all required fittings, terminations, and other installation accessories; all in accordance with this section.

Where larger size conduit is used, reducing couplings will not be permitted so conduit shall be same size for the entire length of the run.

The internal ends of all conduits, metallic and non-metallic shall be reamed to remove burrs and rough edges. Field cuts shall be made square and true. Slip joints or running threads will not be permitted for coupling metallic conduit; however, running threads will be permitted in traffic signal head spiders and rigid galvanized steel (RGS) outer-duct. When installing RGS conduit standard coupling cannot be used, an approved 3-piece coupling shall be used. Threads on all conduit shall be rust-free, clean. All couplings shall be tightened so that a good electrical connection will be made throughout the entire length of the conduit run. All conduit including spare conduits shall be installed with bushings. All conduit including spare conduits shall be installed with plugs, which shall not be removed until installation of conductors or pull string. Upon installation of wiring at other locations, conduit shall be sealed with proper sealant. Upon installation of the pull string, spare conduit shall be plugged.

Where PVC conduit is installed, conduit shall be schedule 40, with the exception that roadway crossings and service lateral runs which shall be schedule 80. Metallic and nonmetallic conduit installation shall include equipment grounding conductor and shall conform to requirements noted in the Standard Plans.

Fittings and support spacing shall be installed in accordance with the NEC and local codes. Where surface mounting of conduit is required, supports shall consist of stainless steel channel with stainless steel or galvanized 2-hole clamps sized for the conduit. Channel supports shall be installed with stops, to prevent clamps from sliding out of the ends. Channel installations shall provide for future conduit installation. Channel shall be at least one (1) foot longer than required.

Where conduit is surface-mounted, approved expansion, deflection, and/or combination expansion/deflection fittings shall be installed at all expansion joints. Expansion fittings shall be installed for up to four (4) inches of horizontal movement. Deflection fittings shall be installed for up to ¾-inch movement in all directions.

C-4.1.4.1.5. Electrical Systems and Electronic Cable

The Contractor shall not splice electric or electronic cables without the Electrical Inspector's approval. The Contractor shall use 1-piece cables between termination points for power, communications control, and RF antenna cables.

When using crimp-on connectors, the Contractor shall install the insulation of electrical cables deep enough into the lug so that the insulation acts as a strain relief. The Contractor shall maintain the electrical continuity of the cable shields. The Contractor shall comply with all manufacturers' requirements for cable and connector terminations.

C-4.1.4.1.6. Wiring

The Contractor shall provide wiring system according to the following:

a) At each junction box, power supply and communication wires and cable shall be labeled with a PVC marking sleeve

b) Power supply circuits the sleeve shall bear the circuit number

c) All splices shall be made in the presence of the Engineer.

C-4.1.4.1.7. Bonding, Grounding

The Contractor shall verify a proper ground exists at each facility and bond to the existing grounding system. All electrical equipment shall be properly grounded for safety. Most equipment shall be furnished with grounding pads or lugs. All ground connections shall be cleaned immediately prior to connection. The Contractor shall provide all grounding material required but not furnished with the equipment. No grounding conductor shall be smaller in size than 12 AWG unless it is a part of an acceptable cable assembly. Ground connections made to metallic cold water piping system at such locations shall be readily available for inspection. Where cold water piping is not available, use other available or made electrodes as described in NEC Sections 250-81 or 250-83. The Contractor will ensure that protection devices are suitable for the specific installation and equipment being supplied, in accordance with NEC, NEMA, ASTM and UL. The Contractor shall ground and bond equipment according to NEC, NEMA, ASTM and UL.

C-4.1.4.1.8. Surge Protection

The Contractor shall provide surge protection incorporated into all electrical paths in order to safely divert energy spikes to an acceptable ground for any new electrical work or system component installation. The surge suppression shall be utilized in conjunction with the grounding system and lightning arrestors to protect equipment.

C-4.1.5. Work Standards and Requirements

To the extent possible TCS installation shall be scheduled so as not to disrupt or delay traffic during the installation process. The Contractor shall make every effort to schedule work around peak traffic movement times. In the event that extended lane closures are

required, closures may have to be accomplished during night hours. Final testing and installation/testing of the cash lanes are more likely to apply to these requirements.

All TCS installation shall be performed according to the NHDOT Approved set of installation plans. The Contractor shall provide project management and oversight of all work performed. At all times when installation work is taking place, the Contractor shall have an individual designated in the Organization Chart as Site Manager on-site to supervise the installation. The Contractor shall install the TCS to the highest standards, using experienced and knowledgeable personnel. For example, journeyman electricians shall terminate all cables, wiring, or fiber optic cables. All tools such as crimpers, fiber optic termination tools, and test equipment shall have been properly calibrated prior to being used.

The Contractor shall provide a safe environment for the installation process in accordance with all applicable local, State and federal requirements, as well as any NHDOT policies. Examples would include but not limited to the following examples:

1. Safety harnesses shall be included and employed on all lifts, and the personnel trained on their use.
2. Hard hats and safety vest shall be worn in all construction areas.
3. Safety toe shoes shall be worn in construction areas and around active roadways while performing installation processes.
4. Regular safety meetings shall be scheduled to review safety procedures.

C-4.1.6. FCC Licensing

The Vendor shall assist NHDOT staff in securing all required FCC licenses required by providing information required for the FCC application such as frequencies, location information, and other related information.

NHDOT shall own the FCC license for all tolling equipment required to have one.

C-5. TCS TESTING

C-5.1. Overview

The requirements described in this section detail the labor, materials, facility, and support services necessary to test the TCS. The testing shall be conducted in various phases and stages as detailed below, to validate the TCS integrity, reliability, functionality and compliance to the requirements set forth in this document including the following technical requirements.

Throughout the project TCS testing shall be completed in the following sequential steps:

1. Factory Acceptance Test (FAT)
2. System Acceptance Test (SAT)
    a. Onsite First Installation Test (OFIT)
    b. Statistical Evaluation Test
3. Installation Commissioning Tests
4. Extended Operations Test (EOT)

Each test indicated above shall be supported by an approved test procedure/script by the NHDOT. Test procedures shall be submitted no later than 30 days prior to performance of each test. This is intended to allow the NHDOT adequate time to review each test procedure and comment prior to test execution. Each test procedure shall specifically describe such items as testing logistics, resource needs, schedule(s) of events, coordination, etc. Any and all costs associated with performance of the tests shall be borne by the Contractor including any transaction processing costs.

At the completion of each test indicated above the Contractor shall provide a detailed test report which describes the test performance, results including all anomalies, failures, etc. The test report shall be reviewed and approved by the NHDOT. Approval of the test report shall be the mechanism used to indicate approval to move the next test phase or project milestone.

The objective of TCS testing is to ensure that the TCS is systematically and thoroughly tested for compliance with this document and operates reliably in accordance with the NHDOT Business Rules and Policies. Testing shall be completed using actual equipment and vehicles. Simulation of messages, events or components will not be permitted. Further the Contractor shall represent in their proposal the ability to complete Factory Testing at a test track type facility.

The TCS provided by the Contractor shall be tested and certified to be interoperable with all E-ZPass agencies, and the entire TCS shall be tested and commissioned prior to opening for revenue collection. The Contractor shall be responsible for all test logistics (coordinating lane closures with NHDOT and the NHDOT, test vehicles, transponders, drivers, etc.) and coordination activities. The Contractor shall provide the test facility that meets the requirements of the testing program. The NHDOT and its representatives shall only witness and Approve the testing and the Contractor shall be responsible for all aspects of the testing. Approval of any aspect of testing shall not relieve the Contractor of the responsibility to meet the full requirements of the Contract.

C-5.2. Master Test Plan

The Contractor shall be required to provide a Master Test Plan covering all aspects of testing within sixty (60) days of receiving Notice to Proceed for the work described in this document.

C-5.3. Factory Acceptance Test (FAT)

The Factory Acceptance Test (FAT) shall be conducted by the Contractor to verify that all functional elements of the TCS and components provided by the Contractor are in conformance with the NHDOT technical and operational requirements and the final System Design as approved by the NHDOT. Additionally during FAT the Contractor shall demonstrate the TCS's ability to operate under periods of heavy processing loads. The FAT test procedures shall include provisions for stress and load testing of the TCS. The Contractor may use simulated processes to perform stress and load testing.

Also during FAT the Contractor shall demonstrate the TCS ability to prevent unauthorized access and represent safeguards to prevent any unauthorized access or use within any of the TCS subsystem or modules.

The FAT shall be conducted at the Contractor's test track facility in accordance with the Approved Master Test Plan and test procedures. The test procedures shall document the test configuration and all exceptions shall be noted.

The NHDOT shall witness the FAT and the results of such testing shall be subject to the NHDOT Approval. FAT shall provide sufficient evidence to the NHDOT that the new TCS meets the operational requirements of this document and any subsequent design document and is ready to be installed on-site. As part of this test, the Contractor shall update the Compliance Matrix in Form 6 in Appendix I that was reviewed and Approved by the NHDOT identifying each requirement and the tests conducted that prove compliance to the Contract requirements.

The Contractor shall provide the required support personnel, test vehicles, test equipment and test environment, and testing shall be conducted in accordance with the Approved test procedures. Upon completion of the FAT, the Contractor shall submit a test report to the NHDOT for Approval that details the results of the test. Upon the completion of any re-tests and Approval of the FAT by the NHDOT, the Contractor shall be given the authorization to move forward to the On-site First Installation Test.

C-5.3.1. FAT Travel Costs

As part of the Factory Acceptance Testing the Contractor shall cover travel expenses for the following:

- Three (3) people;
- Airfare (if driving distance is over 4 hours); and
- Hotel (single occupancy for the duration of the FAT).
- Rental Vehicles

In the event the FAT is required to be retested, the Contractor shall also cover the expense reimbursement per the guidelines above for NHDOT and their Consultants.

C-5.4. System Acceptance Testing

Following successful completion of the FAT the Contractor shall be permitted to begin System Acceptance Testing (SAT). SAT shall be completed in two distinct phases:

1. On-Site First Installation Test (OFIT); and
2. Statistical Evaluation Test.

The SAT will be conducted at a NHDOT Toll Plaza that has the new TCS fully installed and is an intended to be an "end-to-end" test that will be used to test the functionalities and accuracies all the TCS subsystems through the TCS Host and into the CSC/VPC.

All costs associated with the SAT testing efforts, including CSC transaction processing costs, shall be paid for by the Contractor.

C-5.4.1. On-Site First Installation Test

The objective of the On-site First Installation Test (OFIT) is to verify the full functionality of the TCS and its compliance with the requirements of this document and any subsequent design document in a controlled, on-site environment. OFIT shall include a representation of each lane type/mode. Depending on location/plaza used for OFIT, this may require more than one lane to be installed and tested. All equipment provided for the TCS or

related enhancements to the existing TCS by the Contractor shall be part of this test including the communications network. The TCS Host hardware shall be installed in its final locations and all interfaces to other entities shall be tested and ready prior to the start of the OFIT. The Contractor shall detail in the Master Test Plan the logistics of the testing.

The Contractor and the NHDOT shall agree on a test site(s) and the Contractor shall work with the NHDOT in setting up the lane and installing all equipment in the lane. All equipment and software that is required for the new TCS shall be in place, and prior to the start of the test. The Contractor shall formally notify the NHDOT that the TCS is "ready" for testing. The test shall be conducted by the Contractor and witnessed and approved by the NHDOT. The test shall be conducted in accordance to approved test procedures and test schedule, all in accordance with the requirements in this document. Once successful completion of the OFIT has been achieved the Contractor shall complete installation of the remaining lanes at the plaza.

As part of this test, the Contractor shall update the Requirements Traceability Matrix that was reviewed and approved by the NHDOT identifying each requirement and the tests conducted that prove compliance to the Contract requirements. It shall be the Contractor's responsibility to ensure that each requirement is certified and/or tested for compliance.

Any and all anomalies shall be documented and categorized in the OFIT Test Report and corrected, subject to the NHDOT approval.

Upon the successful completion and approval of the OFIT, any further changes to the software shall be fully documented and made only with the approval of the NHDOT. Depending on the changes made to the TCS, the NHDOT reserves the right to request a re-test of the entire or part of the OFIT. The objective of this is to ensure that changes to one part of the TCS do not have a negative effect on the rest of the System.

Interface Testing

As part of the OFIT testing, a TCS to ORT Host and the CSC/VPC interface test shall be conducted to verify that the interface developed meets the requirements of this document, requirements identified through coordination with the NHDOT TCS Contractor and CSC/VPC contractor during the design process (if applicable), and the IAG ICD (if applicable). The Contractor shall develop an interface test plan and submit the plan to the NHDOT for review and Approval. The Contractor shall work with the CSC/VPC Contractor to develop the detailed test procedures that describe all aspects of the interface testing and validation of each test requirement. The interface test shall be coordinated with the CSC/VPC Contractor and testing shall be conducted in accordance with the Approved test procedures. Upon completion of the interface testing, the Contractor shall submit a test report to the NHDOT for Approval that details the results of

the test. The Contractor shall coordinate this testing with the NHDOT and DoIT where applicable to include the systems located in Concord, NH as part of the testing. Contractor shall demonstrate full load regression testing including full loading under the existing and TCS to verify system adequacy.

Disaster Recovery Test

As part of the On-site First Installation Test, the Contractor shall also demonstrate Disaster Recovery procedures in accordance with the Disaster Recovery procedures Approved by the NHDOT

C-5.4.2. Statistical Evaluation Test

The Statistical Evaluation Test shall provide a statistically significant sample size of toll transactions to evaluate the accuracies of the new TCS. This shall be a controlled test where test vehicles will be used to generate all toll transactions. The same plaza that is used for the OFIT shall also be used to conduct the Statistical Evaluation Test. The test will combine testing for both the E-ZPass and cash Toll Collection Systems. The intent of the Statistical Evaluation Test is to test the overall TCS and not individual components. As such, the test will cover the following:

- Cash Toll Collection System (includes ACM transactions)
- E-ZPass System
- AVDC System
- Violation Enforcement System

The dependability of each portion of the TCS, as specified herein shall be evaluated using the data collected during the SAT.

In conducting the Statistical Evaluation Test, the Contractor shall achieve a minimum sample size of 3000 usable transactions in order to validate the performance requirements at a confidence level targeted at 80%.

The accuracy (as a percentage) will be calculated as the ratio between correct transactions that arrive at the plaza/host computer divided by the total number of vehicles observed in the test:

$$\textbf{Accuracy}\ (\%) = \left[\frac{\textbf{No. of Correct Transactions}}{\textbf{Total No. of Vehicles}}\right] * 100\%$$

(Total number of vehicles is the total number of vehicles that actually passed through the lanes during the test period.)

A correct transaction is defined as one that is:

- Accounted for in the lane
- Displayed at the Plaza Computer
- Recorded in the transaction detail function at the Host

C-5.4.3. Measurement of Errors

Single Transaction / Multiple Errors – If a single transaction has two System errors, only one error would be counted in the full TCS error count. For example, if both an AVDC error and a violation enforcement image error occur on a single transaction, that will be one AVDC error, one VES error and one full TCS error.

Errors that do not count in TCS – Some errors will not count against the TCS error count. An example of this would be a single transaction with a missed tag read that was correctly identified as a violation and proper images were created for that transaction.

Component Failures – If it is clear that a component has completely failed then both errors and valid transactions associated with that component will be removed from the test sample.

Automatic Vehicle Classification System – An AVDC error occurs when the AVDC incorrectly or fails to classify any vehicle. It can be either an overclass (AVDC higher class than actual) or an under class (AVDC lower class than actual). An AVDC failure counts both in the AVDC System and TCS count of errors. Another type of error occurs when a TCS report incorrectly counts transactions by classification.

Violation Enforcement System Images – A VES error occurs when the System fails to transmit images for a toll violation; the front and/or rear image does not have the vehicle plate visible in the image; the front and/or rear image for the violating vehicle is not the correct vehicle; a ticket number and/or image is generated for a non toll violation. Another type of error occurs when a TCS report incorrectly counts violation transactions.

E-ZPass System Errors – An E-ZPass System error occurs when a transaction is not recorded; a transaction is recorded, but is placed in the wrong file; transaction data in file does not match what was expected from the lane (an AVDC error would not be an E-ZPass System error); an E-ZPass transaction is recorded for the wrong vehicle. E-ZPass System errors count in both the E-ZPass System count and TCS count. Another type of error occurs when a TCS report incorrectly records and reports E-ZPass transactions.

Mixed/E-ZPass Lane Cash Toll Collection Errors – An Mixed/E-ZPass lane cash TCS error occurs when a toll attendant is unable to record a cash transaction on the toll terminal (due to toll terminal problems); the toll terminal transaction detail does not match with the

detail for that transaction on the plaza monitor. Another type of error occurs when a TCS report incorrectly records and reports the cash transactions.

Only failures encountered during the Statistical Evaluation Test deemed, by the NHDOT, as beyond the control of the System, will be excluded as part of a reliability measure. Such failures may include an improperly located tag, an obstructed tag, or a damaged tag as defined herein. Unsuccessful transactions resulting from equipment or software failures shall be included in all measurements. Other specific tests during the Statistical Evaluation Test shall include:

- File Transfers to demonstrate data file transfer between the lane, the Host and the CSC. Partial and full file transfers shall be tested.
- Archiving of old files to demonstrate the archive and deletion of files functions.
- Demonstrate the non-interruption of in lane operations during CSC to lane file transfers.
- The ability of the lanes to operate in stand-alone mode when the plaza/host computer is not available.
- The ability of the lanes to operate in degraded modes.

  The correctness of Diagnostics/Status messages that flag improper, degraded, or inoperable performance shall be determined, should any occur.

C-5.5. Commissioning Test

Upon the successful completion and approval of the results of the SAT and subsequent test report, the Contractor shall be given the authorization to begin the complete installation of the TCS. As each lane/plaza is installed it shall undergo a Commissioning Test to validate the functionality and operational status of the lanes. Every piece of in-lane equipment and its interface to the plaza and TCS Host shall be verified to be fully operational. During this test the lane interface to the TCS Host and the CSC/VPC interface shall be validated to ensure that the communication system is in place and the NHDOT TCS to ready for revenue collection. The 12-month Warranty period shall begin when all lanes have been commissioned and placed in revenue service.

The entire communications network shall be exercised to ensure that bandwidth is appropriately sized and the network is configured to handle the expected traffic conditions. The installation of all equipment and software, and their operations shall be verified end to end.

Upon the successful completion of the Commissioning Test and approval of the test report, the Contractor shall begin the ninety (90) day Extended Operational Test for the TCS.

C-5.6. Extended Operations Test (EOT)

A ninety (90) day Extended Operations Test (EOT) shall be conducted by the Contractor upon successful completion of installation and commissioning. The System shall be observed in live operations by the Contractor and the NHDOT for a minimum of two (2) continuous months to cover a full monthly audit cycle. During this period System accuracy, performance, reliability, and audit-ability shall be verified. The Contractor shall demonstrate in the Master Test Plan the proposed mechanism for verification of performance.

In order to verify system accuracies and performance compliance, the Contractor shall include the use of video capture for validation purposes. The details of how the video will be setup and utilized shall be described in the EOT Plan.

Over the course of the EOT period, a minimum of 10,000 usable transactions (under live conditions) shall be collected for verification of performance requirements at a confidence level targeted at 80%.

As a component of the EOT the alarms displayed on the MOMS shall be analyzed. Anomalies identified shall be categorized by criticality and resolution of all anomalies shall be made by the Contractor, subject to the NHDOT Approval. These tests shall be repeated until the NHDOT is satisfied that the TCS meets the requirements as set forth in the Approved design documents and the System requirements.

C-6. PROJECT MANAGEMENT AND EXECUTION

C-6.1. Project Reporting and Meetings

C-6.1.1. Monthly Report and Progress Meeting

Monthly progress meetings (in addition to the bi-weekly installation meetings during the active installation periods) shall be held at a location designated by the NHDOT. Three working days prior to the meeting, the Contractor shall submit a monthly progress report of the previous month to the NHDOT. The form of the Monthly Report shall be agreed to as one of the initial project tasks upon NTP and shall be incorporated into the Project Management Plan. The reports shall include the following components:

1. A summary outlining progress and status, and the labor, materials and the percentage of work performed for each task in the Project Schedule. Comments shall be included where appropriate. The summary shall also identify key deliverables met and missed in the period.
2. The report shall include an analysis of all critical path tasks; potential risks associated with the tasks and proposed contingency/work around plans to circumvent delays to the Project.
3. A discussion of Schedule compliance and an updated Project Schedule showing proposed changes from the baseline Approved Project Schedule, if any, and showing progress from the previous month for discussion purposes. If no Project Schedule change has occurred, the Contractor shall so state.
4. An updated action items list that tracks the status of all outstanding Deliverables, activities and issues that need decision/resolution.
5. A progress payment request, if applicable. Progress payment requests will only be considered as a part of the Monthly Report package.
6. A list of change order requests and their status shall be submitted with the Monthly Progress Report.
7. A summary of the time devoted to the Project by each Key Staff for the immediately preceding month.
8. The previous monthly meeting minutes for Approval.
9. A six (6) week look-ahead schedule.

C-6.1.2. Project Meetings

In addition to the monthly progress meeting, weekly project status meetings, and other regularly scheduled or ad-hoc Project meetings may be required during the course of the Project to deal with specific issues as they arise. It is anticipated that in addition to regular overall project status meetings, project specific technical meetings, and interface development meetings shall also take place, as needed.

The Contractor shall perform the following tasks related to all meetings including but not limited to:

- Distribute notices of Project meetings in accordance with document control requirements;
- Prepare the agenda in coordination with the NHDOT;
- Attend the meeting with all required staff in attendance; and
- Prepare draft minutes of the meeting and forward them to the NHDOT within five (5) working days after the day of the meeting.

C-6.2. Staffing

It shall be the Contractor's responsibility to maintain and assign a sufficient number of competent and qualified professionals and other technical personnel to meet the project schedule and requirements.

C-6.2.1. Key Personnel

As a part of its Project Management Plan the Contractor shall provide the NHDOT with an Organization Chart that identifies the Contractor's employees dedicated to this Project (the "Key Staff"). The chart shall identify Key Staff responsibilities and the resources to be used in fulfilling the requirements of this document.

Replacement of Key Staff personnel shall be submitted to the NHDOT for review and Approval prior to replacement of individual.

C-6.2.2. Staffing Plan

The Contractor shall identify in the Project Management Plan staffing requirements at a level immediately below the Key Staff required to meet project requirements. The Staffing Plan shall, in addition to identifying personnel immediately below Key Staff, provide a time line reference for anticipated resource requirements for the duration of the project.

C-6.3. Documentation

The Contractor is required to provide various hardware; software; requirements; design; testing; installation; and maintenance documentation that include Contractor-developed documentation and thirty-party documentation. All documentation provided under the Contract shall meet the requirements described below. All Contractor-developed documentation for the new TCS may be provided in the form of updated existing documentation or new documentation as appropriate.

C-6.3.1. Contractor Developed Documentation

Detailed and accurate documentation is required to ensure sustainability of the TCS and that the NHDOT can operate and maintain the TCS. Detailed documentation shall enable the NHDOT to understand the TCS, thus resulting in better performance of audit and reconciliations. It also shall assist the NHDOT in making better, informed decisions on any required System changes or revisions to Business Rules.

Draft copies of all documentation shall be submitted to the NHDOT for review, and comment and the NHDOT shall have the right to require additional interim drafts at no additional cost should draft documentation submitted not be of adequate quality, or does not incorporate the NHDOT review comments, or have missing or incorrect information.

The Contractor shall submit two (2) hard copies and two (2) electronic versions of all Contractor developed documentation for the NHDOT review and Approval unless otherwise stated. Acceptable softcopy formats are Microsoft Office (latest NHDOT version), and AutoCad up to AutoCad 2004 for Contractor prepared documentation as listed below.

Project Management Plan

The Contractor shall submit a Project Management Plan to the NHDOT for review and Approval. The Project Management Plan shall describe how the Contractor plans to implement and manage the project including staffing, scheduling, communication procedures for controlling all correspondence, submittals, and other communications between the Contractor and the NHDOT.

The Project Management Plan shall at a minimum include the following elements:

1. A description of the management and organization of the program, an organization chart, identification of Key Staff and their responsibilities and identification of the resources to be used in fulfilling the requirements of the Contract.
2. A description of the planning and reporting methods to be utilized, both for use within the Contractor's staff and externally to the NHDOT.
3. A description of the Contractors Quality Assurance and Quality Control approach and program.
4. How day-to-day operations, general issues, and problems are communicated to the NHDOT.
5. How the Project Schedule and performance are reported and tracked for development activities and transition activities.
6. Document the change work order request submittal and approval process.
7. Document the invoice submission, verification, and approval process.
8. A section on communications that addresses:

- **Correspondence –** Correspondence shall be identified as to originator and designated receiver.
- **Document Control –** The Contractor shall manage the Project correspondence through Document Control software to which the NHDOT shall be a user and have access.
- **Submittals -** All submittals shall be submitted as an enclosure to the Contractor's submittal letter. Each submittal letter shall be limited to a single subject or item. The Contractor's letter shall identify the letter itself, Contract Number, Contract Name, and Subject of the submittal.
- **Contract Number and Name -** All items of correspondence, submittals, and documentation shall contain the Contract Number and the designated project name.
- **Information -** No party shall be entitled to rely on any information unless it is in writing and received from the other party's Designated Representative.
- **Change Work Orders -** Any change work orders from the NHDOT shall be in writing and shall be executed by one of the NHDOT's Designated Representatives and one of the Contractor Designated Representatives. The form of change work order will be directed and Approved by the NHDOT.
- **Access to Contractor Key Staff** – the NHDOT or the NHDOT's Designated Representative who is knowledgeable in the field of work, shall have unlimited access to the Key Staff during the Contractor's performance of the Contract.

9. A section on Interim Maintenance and transition with TRMI.
10. A section on coordination with the CSC/VPC.
11. A section that includes all Approved Project forms.

Schedule

The Contractor shall develop a detailed Project Schedule that lists all tasks related to the design, development, testing, installation and deployment of the TCS in Microsoft Project format (latest version of MS Office used by NHDOT). Coordination with the third party civil Contractor shall be identified and all interfacing tasks clearly documented. The Project Schedule shall identify all critical dates and events starting with the Notice to Proceed through the end of the warranty period.

The Project Schedule shall be resource loaded and shall include all draft submissions and review cycles. The Project Schedule shall form the basis for all subsequent schedules and updates throughout the duration of the Project. The Project Schedule shall be baselined

upon Approval and the Contractor is required to update the Project Schedule on a monthly basis showing percent complete. Critical path tasks shall be clearly identified. All changes to the baseline Approved Schedule must be approved by the NHDOT.

TCS Design Documentation

C-6.3.1.1.1. Preliminary Design Review

Within sixty (60) days of the date of the Contractor's Notice to Proceed Letter, the Contractor must conduct a Preliminary Design Review (PDR) of the proposed TCS. The PDR must be a formal presentation to be conducted in the form of a workshop over a one (1) to two (2) day period on-site within the the NHDOT offices. A formal submittal of a PDR document is not required; however, the PDR should be supported by a presentation package such as Microsoft® PowerPoint. An advance copy must be provided five (5) business days prior to the formal presentation for review.

Sections and or topics for the PDR must include, but must not necessarily be limited to, the following:

- TCS Concept and Methodology;
- Project Schedule;
- Overall System Architecture;
- Requirements Matrix covering each System, sub-system or TCS component;
- Integration of existing TCS equipment;
- Installation Overview, including but not limited to;
    - Contractor identified modifications to existing physical infrastructure;
    - Data communications and power requirements ;
    - Computer and networking requirements and coordination with the NHDOT's staff;
    - Relevant product cut-sheets not provided with the Contractor's Proposal;
    - Temporary power and back-up generator requirements and arrangements;
    - MOT notification plans and programs;
- Assess design issues and associated risk;
- Risk Mitigation; and
- System Requirements Matrix.

In addition, the Contractor must address and show compliance with quality assurance, reliability, and maintainability requirements, software development and other System requirements.

Hardware concept drawings and preliminary level engineering specifications must be submitted during this review.

The Contractor must summarize its input along with any related the NHDOT comments and provide a written document memorializing the meeting.

C-6.3.1.1.2. Detail Design Document

C-6.3.1.1.2.1. System Detailed Design Review

A Detail Design Review (DDR) and corresponding Detail Design Document will be required as part of this Contract. All deliverable shall be made in accordance with Table 7-2 Deliverable Deadlines.

The Contractor shall verify interface compatibility among items of equipment to be utilized. The Contractor shall assess risk in all areas of development and provide detailed information on how they will be addressed.

The Contractor shall provide functional narrative text, system and subsystem block diagrams, data flow diagrams, data structure diagrams, schematics and any other graphic illustrations, detailed engineering drawings, shop or fabrication drawings and engineering specifications to demonstrate all elements of the proposed system design.

The DDR submittals shall address and show compliance for system hardware and software with quality assurance, reliability, maintainability, software development, and other requirements of these specifications.

Approval of the DDR does not release the Contractor of the overall responsibility of ensuring that all design requirements, as specified, have been achieved in the final system design.

C-6.3.1.1.2.2. Detailed Design Document

The Contractor shall submit a Detailed Design Document (DDD) that describes the design specifications of all hardware and software provided as part of the TCS to meet the Approved requirements of the Contract. Hardware Design shall describe all hardware specifications, third-party software, configuration, and testing. Software Design shall be described to the process and module level for all of the functions detailed in the Scope of Work and Approved requirements. The DDD shall be submitted in draft form, after which the design reviews shall take place. Upon completion of the design reviews, the DDD shall be revised and submitted to the NHDOT for review and Approval.

The DDD shall include, but not be limited to:

- High Level Overview;
- The specification sheets for all equipment;
- In-lane equipment, equipment enclosure layout and interconnections;
- Listing of all functions, the source of the baseline code (project used on), version and date;
- The requirements for all peripheral device interfaces and control;
- Listing of all software languages used and for what;
- Standards, and conventions used;
- All user interfaces;

- Lane, Plaza and Host layouts, and logic and timing details;
- Degraded mode of operations and impacts of failure on System operations;
- Module level descriptions and interaction among various modules;
- All operational and Business Rules (to be used as a standalone document);
- Interface Control Documents for all interfaces (standalone document(s));
- System data dictionaries;
- Report and screen format (Including table references and data sources);
- Database design and entity relationship modeling;
- Data flow diagrams and table configurations;
- Security access system layout and interconnections;
- Disaster Recovery Plan (standalone document);
- UPS sizing;
- Computer/Server sizing and design details; and
- IP Scheme/Network Architecture diagrams (including subnets).

The DDD shall demonstrate that the Contractor understands the functional and operational requirements of the TCS and has the processes and policies in place to provide a high quality and reliable product that meets the requirements of the Contract.

C-6.3.1.1.3. Shop Drawings

The Contractor shall submit shop drawings detailing the installation design that shall be used on-site in the lane and plaza as well as at the TCS Host for installation work. Detailed drawings shall be provided for each lane configuration and if measurements differ from site to site, these variations shall be noted. All documentation regarding the TCS equipment shall be maintained by the Contractor and made accessible to the NHDOT for review. All documents should have updated and visible version and revision numbers, titles and other information. Examples of documentation to be provided include but are not limited to:

- Detailed installation drawing for each piece of equipment
- Detailed electrical schematics
- Detailed roadside enclosure layout and interconnections drawings
- Detailed equipment rack layout and interconnections drawings
- Detailed communications layout
- Sketches, both hand drawn and computer generated
- Memos denoting changes or modification requirements
- All red line drawings

At the completion of the installation, when all changes and modifications have been incorporated and Approved, this documentation shall be supplied to the NHDOT as part of the as-built package.

Master Test Plan

The Contractor shall submit to the NHDOT, within the time specified in Section 7.7, a detailed plan for testing all components of the TCS. This plan shall include component testing, functional tests and all other tests culminating in the performance of the Factory Acceptance Test, and all Field Testing.

The Contractor's test plan is subject to approval by the NHDOT. The NHDOT shall be permitted to participate in or otherwise observe any and all of these tests. Tentative dates for conducting the various tests shall be included in the test plan, as submitted by the Contractor. The NHDOT shall be notified of the time and place the tests are to be conducted by the Contractor in writing at least ten business days in advance.

The Contractor shall develop detailed test procedures, including pass/fail criteria, for each of the types of testing to be conducted and shall submit these test procedures to the NHDOT for review and approval at least twenty (20) business days prior to the scheduled start of the testing. Only preapproved test procedures shall be used for the testing.

Installation and Transition Plan

The Contractor shall develop a detailed Installation and Transition Plan containing an Implementation Schedule for the entire Project. The Installation and Transition Plan shall be a comprehensive document for all elements of the project beginning with interim maintenance through design, testing, installation, transition to the new TCS, full maintenance and support, ongoing system upgrades throughout the five (5) year term. The Installation and Transition Plan shall include and define, at a minimum, the following items:

1. The installation schedule, detailing phases and/or installation segments. Once the baseline schedule is approved by the NHDOT updates during the installation periods identifying all schedule changes and work progress in the form of percentage completions shall be submitted to the NHDOT.
2. Details on the transition plan from the legacy system to the new TCS from parallel operation of the new TCS Host, to decommissioning of lane and systems, installation, test and commissioning of toll lanes and plazas.
3. How the Contractor shall address equipment and component replacement and expected life cycle over the five (5) year contract term and the two – two (2) year optional terms.
4. The minimum resource allocation requirement for any installation task.
5. How the Contractor manages delivery, staging and installation of lane equipment and TCS Host to be installed.
6. The order in which equipment items are to be installed with estimated durations.
7. Any required prerequisite activities to be accomplished by other Contractors.

8. The coordination between third party Contractors, including the civil Contractor(s), Existing Toll System Contractor and the CSC/VPC Contractor.
9. Any special or unique installation requirements.
10. How the Contractor shall manage system redundancy and applicable disaster recovery facility.
11. A detailed component list and how each item version number and serial number shall be recorded and accurately input to the MOMS for each installation configuration.
12. Organization Chart defining key personnel, roles and responsibilities and contact information.

Maintenance Plan

The Contractor shall submit a Maintenance Plan that describes how the Contractor plans to perform the Maintenance of the new TCS. It shall include a description of the management and organization of the program; an organization chart; identification of key personnel and their responsibilities; identification of staffing; and identification of the resources, equipment and facilities to be used in fulfilling the Maintenance and Software Support Services. It shall also include staffing; coverage; training; scheduling; communications; spare parts inventory management; notification; escalation; and reporting procedures to be utilized by the Contractor while performing maintenance services.

The Maintenance Plan must be approved by the NHDOT prior to Provisional Final System Acceptance.

Manuals

C-6.3.1.1.4. Toll Collector Manual

A Toll Collector Manual shall be provided. This document shall include a complete and simple description of all operational toll collection procedures and a nontechnical description of the Toll Terminal and ETC functions. This manual shall not include any information that will jeopardize the security of the TCS. The manual shall contain illustrations and diagrams as required to demonstrate the step-by-step operations required for processing all normal and irregular toll transactions, opening and closing the lane, and all other toll collector procedures. Final copies of this manual are to be delivered not less than sixty (60) days prior to commencement of the toll collector-training program. Draft copies shall be delivered sufficiently in advance to allow a thirty-day (30) review period, including revisions and eventual approval.

C-6.3.1.1.5. Toll Supervisor Manual

Toll Supervisor Manual shall be provided under this Contract. This document shall provide a complete description of Supervisor's workstation functions, input menu options, and screen format descriptions. Diagrams and simplified instructions are encouraged. This

manual shall include text to define the Supervisor's duties in order to efficiently monitor toll collector activities.

Additionally, the Toll Supervisor Manual shall become the on-line help manual. Final copies and draft copies shall be delivered according to the same schedule identified above for Toll Collector Manuals.

C-6.3.1.1.6. Administration/Audit User's Manual

Administration/Audit User's Manual shall be provided. This manual shall be provided for assisting operators in the daily use of the administration/audit workstation(s) and related peripherals. It shall provide details explaining how the reports are derived and formulated. Complete diagrams, illustrations, and instructions shall be provided for ease of understanding the TCS operation. All operator commands, error messages and responses shall also be explained in detail.

For components not manufactured by the Contractor, the Manufacturer's standard equipment specifications and operator's manuals shall also be provided. All diagrams, illustrations, instructions and procedures shall be appropriately dated. Draft copies of this manual shall be delivered sufficiently in advance to allow a thirty (30) day prior review, revision and approval period.

Additionally, the Administrator/Audit User's Manual shall become the on-line help manual. Final copies of this manual shall be delivered at least sixty (60) days prior to field installation.

C-6.3.1.1.7. Maintenance and Service Manual

Maintenance and Service Manual shall be provided. This document shall be comprehensive and shall provide complete detailed technical descriptions of maintenance operations, including but not limited to the following:

- Preventive Maintenance Schedule;
- Corrective Measures (both temporary and permanent);
- Troubleshooting Techniques;
- Alarms and Severities;
- Maintenance Techniques (routine, preventive, and remedial);
- Location and availability of support services for all major components;
- Point-to-point component wiring schematics and logic signal flows; and
- Assembly and disassembly drawings, including exploded view drawings.

This manual shall be prepared for technical personnel assigned to the maintenance of the TCS. This manual shall include a general description, theory of operation, operator instructions, detailed electrical-electronic logic circuit analysis, mechanical functions, installation, test and trouble-shooting procedures, preventive and corrective maintenance procedures.

The Maintenance Manual shall also contain diagrams, schematics, layouts, troubleshooting charts and parts lists required to service each component and circuit board utilized in the TCS.

The maintenance and service manual shall become the on-line help manual. The detailed service manuals and proprietary information shall be strictly used to ensure proper maintenance.

Standard service manuals for unmodified commercial products used in the TCS shall be acceptable if they contain details and accurate information in order to properly service the specific toll collection equipment supplied under this Contract. Large size diagrams and mechanical assembly diagrams do not have to be reduced or incorporated into the manuals if these drawings are provided with the manuals.

Maintenance Manuals shall be delivered in preliminary form to the NHDOT prior to the commencement of TCS installation. Draft copies of the final, refined Maintenance Manual shall be delivered sufficiently in advance to allow a sixty-day (60) prior review, revision and approval period.

Final System Acceptance shall be contingent upon submittal and approval of the Maintenance Manuals.

Parts Lists and Catalogues

An Electronic copy and three (3) printed copies of a comprehensive and detailed parts list for each and every component included in the TCS shall be supplied. Parts shall be numerically encoded, with all spare parts permanently encoded with the parts lists number for inventory purposes. Parts lists shall be categorized and related to particular system components (major subassemblies) and toll equipment.

Parts lists with component part numbers without descriptive information shall not be accepted. The parts lists shall contain the source vendor's name, identification numbers and codes or other means to identify the manufacturer of each component. Second sources shall be stated for all standard commercial components.

All parts lists and catalogues shall be provided prior to the issuance of a Final System Acceptance.

As-Built Drawings

The Contractor shall provide two (2) complete sets of reproducible transparencies and two (2) complete sets of prints of As-Built drawings for the TCS. The As-Built drawings shall be provided in electronically in CAD and PDF format as well as the earlier mentioned hard copies. The set shall include, but not be limited to, all schematics, logic diagrams, layouts, Wiring Diagrams, assembly drawings, parts detail drawings for mechanical parts design or modified under this Contract, including installation details so as to provide a complete record of the as-built status of the TCS.

The Contractor shall incorporate into the As-Built drawings all design modifications, change orders and field installation changes. At the time of submittal, the Contractor shall certify in writing that the above has been accomplished.

Drawings contained in standard catalogues and manuals for unmodified commercial products do not have to be reproduced as part of the As-Built drawing set. All revisions to standard commercial assemblies or components of the toll system shall be included in the As-Built drawings.

The set of As-Built drawings shall consist of a title sheet, an index sheet and the various As-Built drawings. The index sheets shall include a listing of all drawings with headings for Drawing Number, Drawing Title, and the type of drawing, such as assembly, schematic, material list, wiring diagram, wire list, or similar categories.

The NHDOT will review the As-Built drawings for content and will accept the drawings only when the Contractor has complied with requirements set forth herein.

The Contractor shall deliver all required As-Built drawings prior to Final System Acceptance.

C-6.3.2. Third Party Documentation

The Contractor shall provide standard, commercially available documentation for third-party provided hardware, software, maintenance materials, and support documentation provided under the Contract.

The Contractor shall furnish, install and maintain, in current updated condition, the following ''Primary Set' of all documentation required. This material shall be provided in its commercially available form or in a comparable form and placed in racks or shelves to be retained at the NHDOT Offices or another NHDOT designated location for the duration of the Contract. Additionally, a softcopy of these documents with updates, if available shall be provided to the NHDOT, Acceptable softcopy formats are Microsoft Office (latest NHDOT version), and AutoCad up to AutoCad 2004 for Contractor prepared

documentation as listed below. All updated documents shall show the revisions and also include a version of the clean document.

The Contractor shall provide two (2) hard copies and two (2) electronic versions of all hardware/software and user manuals for all third party sources.

C-6.3.3. Third Party Software Documentation

The Third Party Software Documentation shall include, but not be limited to all user's manuals; programmer's reference manuals; Warranty documentation; installation manuals; and Maintenance manuals, and shall contain all required information on items including the operating system; utilities; programming languages; application software; and communications software. The package shall also include all required electronic media to install, operate, and maintain the System being supplied. The Third Party Software Documentation shall be provided by the Contractor in a standard and organized format, with appropriate labels, tabs, and cross references to allow the NHDOT to easily access and reference information on each software component on the System. Third party documentation if available for the security access system is acceptable to the NHDOT.

All patches and updates made to the System software (third party and Contractor) after Final System Acceptance shall also be provided to the NHDOT in electronic media. A description of what patches and updates are considered part of the established maintenance fee and what is considered extra work shall be defined in the maintenance plan.

C-6.3.4. Third Party Hardware Documentation

The Third Party Hardware Documentation shall include, but not be limited to all technical manuals; operator's guides; installation guides; warranty documentation; hardware reference manuals; available options and versions; catalogs; components; and illustrated parts lists. The third party hardware manual shall be provided by the Contractor in a standard and organized format, with appropriate labels, tabs and cross references to allow the NHDOT to easily access and reference hardware information on each equipment component. Additionally, with each third party hardware manual, the Contractor shall include sufficient documentation to describe the configuration of the hardware as it was set by the Contractor for the TCS. Any such configuration changes shall be provided to the NHDOT in the form of a bulletin and a change to the relevant documentation.

C-6.4. Quality Assurance and Quality Control

The Contractor shall establish and maintain an effective Quality Assurance (QA) Program to ensure compliance with the Contract. The QA Program shall ensure adequate quality

throughout all areas of performance, including, design, development, fabrication, processing, assembly, inspection, test, Maintenance, packaging, shipping, storage, site preparation and installation. This Quality Assurance Plan identified below shall detail the process and procedures instituted by the Contractor to ensure the QA program is in place.

All supplies and services for the TCS, whether manufactured or performed within the Contractor's plant or at any other source, shall be controlled at all points necessary to ensure conformance to the specifications of these technical requirements. The QA Program shall provide for the prevention and ready detection of discrepancies and for timely and positive corrective action. The Contractor shall make objective evidence of quality conformance readily available to the NHDOT.

The QA Program shall include effective quality control of purchased materials and subcontracted work. Manufacturing, fabrication, and assembly work conducted within the Contractor's plant shall be controlled completely by the Contractor.

C-6.4.1. Configuration Management System

As part of the PMP the Contractor shall describe the Configuration Management System that is utilized for the Project. Configuration management process shall detail TCS defect tracking, change control, software changes and testing including regression testing, release notes and approval, deployment of software changes in production and verification.

C-6.4.2. Change Control Process

The QA Plan shall detail the Contractor's Change Control Process that is instituted for the NHDOT TCS upgrade project.

C-6.4.3. Records

The Contractor shall maintain records or data essential to providing objective evidence of quality until the expiration of the guarantee/warranty period and they shall be made available to the NHDOT upon request. Examples of quality-related data include: inspection and test results, records of sub-Contractor QA/QC Programs, cost records pertinent to acceptance of nonconforming material, change odder backup, design reviews and walkthroughs, and the results of internal and vendor audits. Records shall be maintained in a manner that shall allow for easy access and analysis of the status of the overall QA/QC Program.

C-6.4.4. Control of Purchase

The Contractor shall ensure that all supplies, components, developmental tools, assemblies, subassemblies, and services procured from Subcontractors and vendors conform to the specifications of these technical requirements. The Contractor's responsibility includes the establishment of procedures for the selection of qualified

suppliers. In selecting qualified suppliers, the Contractor shall ensure that the Subcontractors and vendors control the quality of the supplies and services provided. Purchase orders for equipment furnished and supplied under this document shall be submitted to the NHDOT and the NHDOT shall have the option to approve every purchase order as required. Approval of a purchase order shall not constitute Approval of the equipment or the design.

C-6.4.5. Inspection and Verification

The Contractor's QA Program shall include requirements for inspection and verification for in-process, final assembly, unit tests and System testing of the Contractor supplied Systems.

C-6.4.6. Handling, Storage and Delivery

The Contractor's QA Program shall provide for adequate, documented handling, storage, preservation, packaging, and shipping instructions to protect the quality of products required by these technical requirements. Any unique or special requirements applicable to procured items shall be delineated in the procurement documents. All procurement documents shall be made available to the NHDOT upon request.

C-6.4.7. Inspection at Subcontractor and Contractor Facilities

The NHDOT reserves the right to inspect, at the source, supplies or services not manufactured or performed within the Contractor's facility. NHDOT inspection shall not constitute Approval, nor shall it in any way replace the Contractor's inspection activity or relieve the Contractor of the responsibility to furnish an acceptable end product.

C-6.4.8. Access to/Inspection of Contractor's Facilities

Upon request, the NHDOT shall have access to the Contractor's facilities and personnel. This access may be restricted to those portions of the facilities and personnel involved with or otherwise performing work for the TCS. Such access shall be for the purpose of inspecting the facilities, verifying progress, inspecting materials, work-in-progress and finished goods, or verifying test performance and results.

C-6.5. Training

Contractor shall provide a training schedule for toll collectors, supervisors, administration staff, and maintenance personnel. The Contractor will train the NHDOT'S toll collection staff in the functions of the toll collectors. Training shall include both "classroom" training as well be available for hands-on or in-the-field training.

A separate training course shall be provided, at a location in New Hampshire designated by the NHDOT, for each of the following categories of personnel:

- Toll Collectors;
    - *Five (5) sessions of courses required with a class size of up to ten (10) people and a minimum of two (2) hours per training class.*
- Supervisors;
    - *Two (2) sessions of courses required with a class size of up to ten (10) people and a minimum of four (4) hours per training class.*
- Administrator/Auditor Personnel;
    - *Two (2) sessions of courses required with a class size of up to ten (10) people and a minimum of four (4) hour per training class.*
- Operations Personnel
    - *One session of course required with a class size of up to ten (10) people and a minimum of four (4) hours per training class.*

Maintenance training shall include both "classroom" training and extensive field training. These requirements shall be satisfied during the Warranty Period, commencing at a time designated by the NHDOT.

The Contractor shall provide complete set of training manuals for all personnel to be trained.

In support of future collector training the Contractor shall also provide three (3) training workstations.

C-7. PROJECT SCHEDULE, PHASES AND MILESTONES

This section shall provide an overall summary of project phasing, scheduling, and milestone achievements.

C-7.1. Project Phases

The TCS upgrade and maintenance project shall be divided into three (3) overall phases, generally delineated by successful completion of major milestones. These phases include:

Phase I – Interim Maintenance - This phase shall include the immediate assumption of maintenance by the Contractor on the existing legacy TCS. Preliminary transitional efforts under this Phase shall begin approximately four (4) to six (6) weeks prior to the expiration of the current maintenance contract with TRMI (Contract expires June 30, 2012). Phase I shall be considered completed once the new TCS has been commissioned and granted Phase II Approval by the NHDOT;

Phase II - New TCS Deployment - Phase shall involve the various efforts and task required to design, develop, install and commission the new TCS for revenue collection. Phase II shall be accomplished under the following sub phases;

> **Phase IIA – Design, Development and Factory Test** – Under this sub phase the Contractor shall complete the new TCS design and develop culminating in Factory Acceptance Test (FAT).
>
> **Phase IIB – Installation, System Acceptance Testing and Commissioning** – This will include the necessary efforts to provide any and all necessary installation and upgrade efforts including system commissioning testing.
>
> **Phase IIC – Extended Operations Test** (EOT) – This test will be a 90 day evaluation of the new TCS under live operating conditions to prove out conformance with the specified requirements. This phase also includes full system warranty support and maintenance by the Contractor.

Phase III - TCS Maintenance and Warranty – This phase includes both the provisions of full maintenance and system support during a twelve (12) month Warranty Period, following issuance of Provisional Final System Acceptance, and throughout the maintenance term ending 6/30/2017.

The following table represents the completion deadlines required for each major Phase of the Project:

Table 7-1 – Project Phases

PROJECT PHASE	MILESTONE COMPLETION DATE
Phase I – Interim Maintenance	June 30, 2013
Phase II – New TCS Deployment	
Phase IIA – Design, Development and Factory Test	160 Days from NTP(tentative*)
Phase IIB – Installation, System Acceptance Testing , and Commissioning)	June 30, 2013
Phase IIC – Extended Operations Test	September 30, 2013
Phase III –TCS Warranty and Maintenance Term	June 30, 2017

*The milestone completion date for Phase IIA shall be subject to the approved baseline schedule submitted by the contractor.

The new TCS shall be ready for full use and revenue service no later than the date as dictated by completion of the Phase IIB Milestone. If TCS problems are detected during the EOT period, and the equipment is not operating at an acceptable level of performance as defined in this RFP, the Contractor shall be notified in writing immediately. Problems or defects shall be promptly resolved by the Contractor. System Approval shall not be granted by the NHDOT until the TCS performs satisfactorily. It is also noted that within each overall Phase, there are several interim deliverable deadlines, as outlined in this document.

C-7.2. Project Schedule

The Contractor shall begin work on the date specified in the Notice to Proceed (NTP). NTP will be issued by the NHDOT following Governor and Council approval.

Within thirty (30) days after NTP the Contractor shall prepare and submit a detailed Project Schedule outlining the order in which they propose that work shall be performed. The specific installation deadlines set forth in this RFP shall be identified in this Project Schedule. The schedule shall be used as a basis for progress tracking throughout the course of the project.

Schedules shall be submitted in both printed and digital format using Microsoft Project®.

If a delay in the work schedule arises due to circumstances beyond the Contractor's control, the Contractor shall submit a revised project schedule within ten (10) days after it is requested by the NHDOT. Any failure or delinquency in submission of the schedule shall be treated as default on the part of the Contractor, who will then become liable for all

possible actions which can be taken, including withholding of any payments due on the Contract.

C-7.3. Work Progress

The Contractor shall use all practical means to make the progress of the work conform fully to the Project Schedule. If the Contractor fails to meet the Project Schedule, the NHDOT may require them to take any or all of the following actions at no additional cost to the NHDOT:

- Perform overtime work;
- Increase the number of personnel assigned to the project; and
- Increase plant or machine capacity.

The Contractor shall prepare and submit to the NHDOT monthly progress reports on the status of all major items and activities. The monthly progress report shall include an updated Project Schedule.

Project progress meetings shall be conducted monthly at the offices of the NHDOT, at a schedule to be proposed by the Contractor and approved by the NHDOT. The purpose of these meetings will be to monitor progress, discuss design issues and plan for system installation, test and start up of operations.

C-7.4. Phase I

Phase I shall commence upon issuance of NTP. Phase I shall serve as both the initial start of the project as well as providing legacy TCS maintenance support.

As an initial effort and submittal of the Project Schedule a kickoff meeting shall be held within thirty (30) days of the NTP. At this meeting, all appropriate lines of communication for both oral and written correspondence shall be established. Appropriate methods for documenting meetings, telephone conversations and other communications shall also be defined. The Contractor's Project Schedule shall be reviewed in detail and refined as necessary. The NHDOT shall submit in writing any modification or comments to the Contractor's Project Schedule.

Beginning no later than the date specified in Table 7-1 the Contractor shall begin transition efforts to assume full maintenance of the legacy TCS. The Contractor shall also provide an

Interim Maintenance Plan no later than (30) days after NTP for review and approval by the NHDOT.

The Contractor shall continue to provide Interim Maintenance support until Phase IIB has been successfully completed.

C-7.5. Phase II

As indicated Phase II will be accomplished over three (3) sub-phases whereby the Contractor shall design, develop, install and commission for use the new TCS.

C-7.5.1. Phase IIA

Efforts during this phase shall include all system design, software development, hardware procurement and fabrication, shop testing, software testing, software documentation culminating in a full Factory Acceptance Test (FAT).

Periodically throughout this Phase, the NHDOT may visit the Contractor's facility/facilities in order to inspect work in progress and may, from time-to-time, request reasonable demonstrations of toll collection equipment and subsystems. The NHDOT will give reasonable advance notice prior to factory visits. At such time as the Contractor has completed all development and fabrication of the Toll Collection System, including detailed internal testing, the Contractor shall provide written notice to the NHDOT requesting the scheduling of a full Factory Acceptance Test.

The Contractor shall provide test scripts for the review and approval of the NHDOT no later than 60 days prior to the scheduled date of the FAT. The Contractor shall provide written results and evidence of his/her own testing prior to the Factory Acceptance Test. If the proposed test scripts have been approved and, if after reviewing the evidence of the Contractor's internal testing of the toll system the NHDOT agrees that the Contractor has sufficiently tested at the factory level, a Factory Acceptance Test can be performed.

Factory Acceptance Test shall involve testing of all subsystems to be installed as part of the Toll Collection System. All components shall be fully fabricated and integrated, ready for installation at the time of the Factory Acceptance Test. At least one complete subsystem of each category shall be installed at the Contractor's site for the purpose of this Factory Acceptance Test, including:

- One Dedicated/ETC lane set, including ETC subsystem, PFD, canopy signal light, loops (simulation), plus all necessary communication equipment;

- One Manual/ETC lane set, including ETC subsystem, interconnections to a patron fare display, receipt printer, card readers, loops and/or other vehicle separation devices (simulation), traffic light, canopy light, plus all necessary communication equipment;

- One Manual/ACM/ETC lane set, including ETC subsystem, ACM, interconnections to a patron fare display, receipt printer, card readers, loops and/or other vehicle separation devices (simulation), traffic light, canopy light, plus all necessary communication equipment;

- The Host System with fully configured computer system including all software, all printers and peripherals, the Plaza Level Subsystem, and administration/audit sub-system including the Supervisor Workstation, Toll Collector Workstation, and Cash Count Workstation;

- VES System including VES Camera, monitor, VES/Image Capture Server and integration with real-time transaction from lane controller.

Any toll system functions defined in this Contract as well as any Contract amendments shall be subject to detailed testing and verification by the NHDOT during the Factory Acceptance Test. If, in the judgment of the NHDOT, the Factory Acceptance Test indicates that the toll collection equipment and software appear to be functioning satisfactorily in accordance with a predefined test plan and all functional and technical requirements of the Contract, the NHDOT shall issue written approval of the Factory Acceptance Test and immediately authorize shipment of equipment to the site for field installation.

This Approval of the Factory Acceptance Test shall in no way reduce or eliminate the Contractor's full responsibility to resolve any problems and make the TCS work in full conformance with the requirements of this Contract. Nor shall it limit the rights of the NHDOT or the NHDOT, to bring toll system problems to the attention of the Contractor at a later time.

C-7.5.2. Phase IIB

With the issuance of Factory Acceptance Test approval by the NHDOT, the Contractor may be authorized to immediately begin the System Acceptance Testing (SAT), Installation and Commissioning Phase. No actual equipment installation activity shall take place on site until Factory Acceptance Test approval has been obtained. However, if any

preliminary installation or other minor physical modifications are required, these may be performed prior to approval of the Factory Acceptance Test. Any pre-Factory Acceptance Test approval installation activity shall be approved, in writing, by the NHDOT.

Any necessary plans for civil works shall be submitted to the NHDOT for review and approval. Actual installation will be inspected by, and subject to the approval of the NHDOT. All required traffic control shall be provided by the Contractor subject to the approval of the NHDOT.

Installation of any new toll collection equipment shall be performed by trained personnel who are familiar with all aspects of the toll equipment. During the installation phase of the project, the Contractor shall provide a full time on-site Project Manager and or Installation Manager conveniently located and accessible to the NHDOT. During phases other than the installation phases, the Contractor's Project Manager shall be readily accessible via telephone and/or pager. In addition, the Contractor's Project Manager shall report to the site within 24 hour notification from the NHDOT.

During any and all installation efforts the Installation and or Project Manager shall coordinate closely with both NHDOT's toll operations staff.

In the event that any structure is damaged due to the Contractor's activities, such damage shall be repaired immediately at the Contractor's expense and to the satisfaction of the NHDOT.

The Contractor under the supervision of the NHDOT shall perform the On-Site First Installation Test (OFIT). This testing shall include individual lane equipment, communication networks and any other reasonable test that may be required to verify proper functioning of the TCS.

Once OFIT has been successfully completed the Contractor shall then begin Statistical Evaluation Test which shall involve controlled testing of the new TCS to verify full end-to-end system functionality. Successful completion of Statistical Evaluation Test shall indicate that the new TCS is ready for full system wide deployment and Commissioning.

Once the Statistical Evaluation Test is completed and approved by the NHDOT the Contractor may then begin to complete installation and Commissioning throughout the remainder of the system, plazas and lanes. As each lane is completed the Contractor shall then perform Commissioning tests to validate lane functionality and preparedness for live traffic and revenue collection operations.

C-7.5.3. Phase IIC

Phase IIC will commence once the entire system is installed and successfully commissioned. During this Phase of this Contract, a ninety (90) day Extended Operations

Test (EOT) of the new TCS shall take place under live traffic conditions. The Contractor shall be required to fully support and maintain the TCS, in accordance with provisions set forth in Section 8 of this document. Any problems detected during the monitoring of the toll system during Phase IIC shall be immediately brought to the attention of the Contractor and the NHDOT for resolution. At the conclusion of this evaluation period, if the system is considered to be operating fully in compliance with Contract requirements, the NHDOT shall provide the Contractor with written notice of Final System Acceptance.

Throughout the period of the EOT the Contractor shall provide a full time manager on-site to advise and assist the NHDOT in start-up and initial operation of the TCS.

C-7.6. Phase III

The final phase of this Contract, Phase III, shall include continued toll system maintenance through the 12-month Warranty Period. The Warranty Period commences when all lanes have been commissioned and placed in revenue service.

All provisions, as set forth in Section 0 of this document shall be in effect throughout the Warranty Period. During this Period the Contractor shall supply adequate maintenance personnel, spare parts and factory support to ensure the system shall remain fully operational in full accordance with system performance requirements and problems are corrected within the repair/replacement as specified in this RFP.

C-7.7. Summary of Delivery Deadlines

To assist the Contractor a number of the interim deliverables are presented in Table 7-2. In case of differences between the text in this document the table shall govern.

Table 7-2 – Deliverable Deadlines

Deliverable	Due Date
Project Management Plan	30 Days from NTP
Baseline Project Schedule	30 Days from NTP
Interim Maintenance Plan	30 Days from NTP
System Requirements Matrix	60 Days from NTP
Preliminary Design Review Meeting	60 Days from NTP
Master Test Plan	75 Days from NTP
Approved Draft Business Rule Document	90 Days from NTP
Approved Draft Interface Control Documents	90 Days from NTP

Approved Draft Detailed Design Document	120 Days from NTP
Approved Final Business Rule Document	180 Days from NTP
Approved Final Interface Control Documents	180 Days from NTP
Approved Final Detailed Design Document	210 Days from NTP
Factory Acceptance Test (FAT) Plan	30 Days before the schedule test
Draft Training Plan	90 Days Prior to Commissioning
Installation, Transition, and Data Migration Plan	60 Days Prior to Commissioning
Training Completed	30 Days Prior to Commissioning
System Acceptance Test (SAT) Plan	30 Days before the schedule test
Commissioning Test Plan	30 Days before the schedule test
Toll Collector Manual	45 Days Prior to Commissioning
Toll Supervisor Manual	45 Days Prior to Commissioning
Administrator/Audit User Manual	30 Days Prior to Commissioning
Final Shop Drawings	30 Days Prior to Commissioning
Maintenance Plan	30 Days prior to Commissioning
Maintenance and Service Manual	60 Days after Installation
Parts List and BOM	30 Days prior to Final System Acceptance
As-Built Drawings	30 Days prior to Final System Acceptance

Unless stated or otherwise agreed to between the NHDOT and the Contractor, the standard review time for the NHDOT shall be fifteen (15) business days.

C-8. PHASE III - TCS MAINTENANCE

C-8.1. TCS Maintenance and Software Continuous Support Services

The Contractor shall provide maintenance and software support to the TCS and support systems on a 24 hour, 365 day per year basis. The level of service shall be adequate to meet or exceed all systems availability, response and repair times as defined in the Contract. The Contractor shall provide the required access, all tools, vehicles, training, and any other materials required to maintain the TCS and related systems at required levels of operation.

C-8.1.1. Summary Scope of Work

The Contractors shall provide maintenance over an initial five (5) year term with two (2), two (2) year extensions. The maximum allowable maintenance coverage cannot exceed nine (9) years. Contractors are expected to provide pricing for the initial five (5) year service agreement and two options for two (2) additional years each to provide 24 hour, 7 days per week, 365 day full year service level coverage for Maintenance and Technical Services. Full TCS Warranty and Maintenance Services shall begin upon the issuance of Provisional Final System Acceptance. Maintenance services shall also be provided throughout the installation and commissioning period as lanes are transitioned from the legacy system to the new system.

Sixty (60) days prior to the end of the Contract, NHDOT shall notify the Contractor as to the desire to continue the Maintenance Contract by the election of one of the two options for two (2) additional years of maintenance.

The Maintenance Services Scope of Work shall include monitoring, preventive, predictive, corrective, and emergency Maintenance services to be performed on all elements of the TCS. The Maintenance and Software Support Services Scope of Work shall include but not limited to the following:

1. In-lane TCS System (Hardware Only and Software);
2. UPS Equipment;
3. Enclosures and Racks;
4. Equipment Mounting Brackets, Hardware and Structures;
5. Cables, Wiring, and Terminations;
6. Network Equipment, Communications Components, and Enclosures;
    - TCS local area networks;
    - Routers, switches, and other signal directing equipment;
    - Ethernet, fiber optic, and other connecting wires and cables;
    - Data wire and cable terminations and splices; and
    - AC/DC power cables and connectors for LAN equipment

7. TCS Host CPS (Hardware Only);
8. All Third Party Software;
9. MOMS;
10. System Administration;
    - Daily, weekly, or periodic Maintenance necessary to maintain the TCS at required performance levels (for example: purging old files, adding new tables or directories, etc.);
    - Retrieval of data manually, if required;
    - Performing disaster recovery procedures as needed;
    - System shutdown and re-start, if required, to keep the System operational;
    - Re-establishment or re-installation of System files, programs and parameters, as required, following a failure or damage to the TCS;
    - Investigation and analysis of anomalies to include trend analysis;
    - Monitoring, notifications, and initiating corrective actions on application programs to meet requirements;
    - Performance of ad hoc queries based on the NHDOT requests and provide reports on all requests;
    - Provide user support to NHDOT personnel that require access to the TCS;
    - Monitoring of error and System logs;
    - Third party software or firmware upgrades, as required;
    - Providing changes to configurable parameters as requested by the Agency;
    - Performance of software updates resulting from corrective action, business rule changes, and configuration changes;
    - Verification of successful download of Transponder status files daily and report the status;
    - Verify processes and scheduled job are successful;
    - Verification on a daily basis that transactions are being generated in the lanes and these transactions are being sent appropriately to the TCS Host and then on to the CSC/VPC, and report the status;
    - Maintenance of up-to-date software back ups and archiving (all TCS software and data);
    - Performing security software upgrades, data base upgrades and operating system upgrades;
    - Installation of new software and confirmation of successful installation;
    - Daily verification of image transfer from the in-lane VES to the image server;
    - Verification that the MOMS is receiving and processing TCS events and reporting the correct status;
    - Performance of regular virus protection updates in accordance with recommended Maintenance schedule; and
    - Verification of time synchronization is occurring as configured and System clocks are not drifting beyond acceptable threshold.

11. Software Changes within scope of RFP; and
12. TCS Host System
    - Servers including operating system, databases, disks, hard drives, and backup systems;

- ORT Host Central Processing System including the MOMS;
- Software changes required to accommodate changes to Business Rules or lane configurations;
- System monitoring, and
- UPS.

C-8.1.2. Maintenance and Software Support Services

The Contractor shall fully maintain and support the hardware, software, firmware, subsystems and all related supporting infrastructure subsystems of the new TCS. Support services will include all levels of repair and troubleshooting necessary to restore the TCS to revenue collection operating levels defined in this RFP. Maintenance and support services shall include the following list in Section 8.1.1.

C-8.2. Warranty Program

The Contractor shall provide a 12 month Warranty to start on the date that all lanes have been commissioned and placed in revenue service. The Warranty shall be all-inclusive where the Contractor shall provide on-site response to any service affecting the TCS operations; this includes Preventive Maintenance. Maintenance service shall be provided on a twenty-four (24) hour, seven (7) day per week basis during the warranty period.

During the warranty period, any defects and/or malfunctions identified by NHDOT shall be brought to the attention of Contractor in writing prior to the expiration of the Warranty Period. Written communication of any defects shall be submitted to the Contractor in a standardized form. The format and content of the form shall be developed by the Contractor and subject to the approval of NHDOT. The Contractor shall make repairs under the terms of the Warranty.

The Warranty Program shall not limit the responsibility of the Contractor for designing, fabricating and installing equipment in a good and workmanlike manner and in accordance with good industry standards.

C-8.2.1. Hardware Warranty Program including Third Party Warranty

The Warranty Program shall cover all components (hardware, software and firmware, infrastructure) furnished under this Contract as being free of defects in equipment, software and workmanship for a period 1 year from Provisional Final System Acceptance.

In addition, the Contractor shall require that in agreements with Subcontractors and Suppliers (Third Parties), such parties shall assign and furnish warranties and representations to NHDOT.

C-8.2.2. Software Warranty

All software and firmware furnished under the Contract shall be warranted by both the Contractor and manufacturer(s) to be free of defects in workmanship for a period of four (4) years after the one-year all-inclusive warranty. All software and firmware shall remain in good working order in the sole judgment of NHDOT; and, shall meet or exceed the requirements of the RFP Technical Specifications.

Software Problem Definitions

Software problems manifest themselves in several ways, the results of which are termed either as errors, defects, bugs or a malfunction. These software problems are defined as follows.

Error/Bug - A problem found in the development environment before the product is placed in production or service.

Defect - Any functional, equipment, or system problems that are identified that does not conform to the system or product's specifications. An Error or Bug causes a defect to occur in system/software.

Malfunction - A malfunction is produced by a program defect or bug that causes a program to work poorly, produce incorrect results, or crash.

Defect Severity

Defects are classified by their severity. Table 8-1 provides brief descriptions of the severity levels:

Table 8-1 - Severity Levels

Severity Level	Description
Severity 1: Critical	Any problem that could lead to a loss of revenue for the entire system and there is no *workaround*
Severity 2: High	A functional problem that does not cause a significant loss of revenue, or loss of operation. Defects in this category generally have a functional workaround.
Severity 3: Low	A minor technical error that does not impact reporting and operations.
Severity 4: Cosmetic	Cosmetic issues involve non-data related screen display.

C-8.2.3. Server Hardware Warranty

The Warranty Program shall cover all computer server components including new, reused and upgraded as being free of defects in equipment, software and workmanship for a period 1 year from Provisional Final System Acceptance.

C-8.3. Maintenance Plan

The selected Contractor shall provide a detailed Maintenance Plan deliverable no later than 30 days prior to start of installation. The Maintenance Plan shall detail the maintenance procedures of how the Contractor will meet the requirements of this RFP and perform the Work. In addition the Maintenance Plan will include the following:

1. Maintenance Management & Personnel
2. Maintenance Methodology
3. Maintenance Procedures
   - Preventive, Predictive Emergency & Corrective Maintenance Procedures
   - Repair and Replacement Procedures
   - Lane Closings

- Corrective Maintenance Priority Matrix

4. Service Call Procedures (Technicians)(24/7 X 365)
    - Technician Responsibility- Notification & Acknowledgement
    - Call Escalation
    - Service Call Closure
    - Reporting Service Calls with Actual/Potential Loss of Data
5. Safety Procedures
6. Spare Parts and Inventory Control
7. Maintenance Reporting and Control
8. Preventive Maintenance Schedule – Shall include such items as the following:
    - Inspection of outdoor equipment and connections for signs of moisture and corrosion
    - Antennas and scanners for vehicle strikes
    - VES Camera and Lighting
    - Check internal temperatures for servers & lane controller
    - Data center server equipment filters
    - Treadle contact strips
9. Corrective Maintenance Priority Matrix
10. Maintenance Roster/Organization Chart

C-8.4. Maintenance Requirements

C-8.4.1. Maintenance Coverage and Response Times

The Maintenance Coverage and Response Times requirements for the New TCS are as follows:

Table 8-2 - Repair and Response Times

Severity Level	Time to Respond	Time to Repair
Mission Critical	1 Hour	2 Hours
High Priority	4 Hours	24 Hours
Medium Priority	8 Hours	2 Business Days
Low Priority	1 Business Day	5 Business Days

* Failure to meet Repair times due to NHDOT physical restrictions shall not be held against the Contractor. In the event a repair time is affected by such restriction it shall be recorded including the length of the delay.
** If determined by NHDOT that repair times are not met due to required interaction from TRMI, NHDOT may waive any potential liquidated damages.

Response and Repair times shall be calculated on a per event basis.

Response times shall be determined based on when the Contractor receives notification of an event, and the time the Contractor acknowledges said event.

Repair times shall be determined based on when the event is acknowledged and when it has been fully resolved.

C-8.4.2. Maintenance On-Line Management System (MOMS)

The Contractor shall provide MOMS to monitor and facilitate the Maintenance of the TCS. MOMS shall have the capability of a comprehensive tool used for monitoring and reporting System status. MOMS shall be a standalone system that is not integrated into the MOMS for the existing system. The server application and database shall reside on a dedicated MOMS server or integrated with the TCS Host server as determined during the Design phase. The Contractor shall ensure that the furnished MOMS shall have the following capabilities:

1. Receive and monitor status messages from all devices, processes, and Systems.
2. Capable of local manual entry or email entry by authorized NHDOT or Contractor personnel. Entry shall be recorded and automatically tracked to closure.

3. Data is stored in a relational data base to permit data recovery and flexibility in reporting the raw data.
4. Automatically generate and print or email daily and monthly performance reports as determined by the NHDOT during Design.
5. Track device failures, process failures and service requests.
6. Assign priorities and actions to events.
7. Automatic notification to the Maintenance technicians via reports, email, and/or paging.
8. Record time of acknowledgement, time to respond (both remotely and on-site) and time of repair by Contractor's Maintenance personnel assigned to problem.
9. Automatic notification includes the Mission Critical fault designator and record status of Mission Critical, High, and Medium priority work order paging.
10. Record completion of service calls as well as the ability to filter the records based on priority levels of calls.
11. Maintain list of vendors from where products are procured from to include 2nd source.
12. All Warranty information on all equipment and third party software maintained in System.
13. Maintain and track repair Maintenance activity.
14. Asset management and spare parts inventory.
15. Schedule preventive and predictive Maintenance activities.
16. Manage the TCS equipment inventory with purchase order generation for parts replacement.
17. User level security.
18. Automatic alert for spare parts levels, work order not closed out in specified time.
19. Provide various System performance, device performance, staff performance, and management reports.

The presence of a MOMS notification on the System workstation or via electronic notification shall constitute the start of the response time for purposes of measuring the Contractor's response time. Notwithstanding the foregoing, failure of the MOMs system to generate an alert shall not be deemed a waiver of the response time requirement. In this case, notification shall be considered to commence upon the time of the actual system failure.

C-8.4.3. Preventive Maintenance

Preventive Maintenance (PM) – Involves scheduled maintenance activity of the TCS ensuring that the equipment is operating properly and within specified parameters. The Contractor shall identify system components that will undergo PM and utilize MOMS to create a PM schedule the will automatically issue work orders to the field technicians. In-lane PM will be limited to module or component level replacement.

C-8.4.4. Predictive Maintenance

The Contractor shall use Predictive Maintenance (PrM) methods to maintain the TCS. PrM uses MOMS historical data to predict what components or parts are likely to fail in a given time period. Through the evaluation of mean time to repair (MTTR) and mean time between failures (MTBF) data, it is possible to schedule a component or part to be replaced near the end of its normal expected life prior to the occurrence of a failure.

C-8.4.5. Corrective Maintenance

The Contractor shall utilize a Corrective Maintenance (CrM) process to maintain the TCS – CrM involves diagnosing and correcting TCS problems, which may be related but not limited to system performance, function, or availability in order to meet the normal operating requirements of the TCS. For repeated failure of TCS components, the Contractor shall undertake an investigation and if the problem is determined by NHDOT to be a pervasive defect, the Contractor shall correct the problem at no additional charge.

C-8.4.6. Upgrades and Enhancements

Software modifications that are required to maintain and support the System as a part of the normal course of business such as version changes, configuration or parameter changes or minor changes to software or code; or, changes that improve the Contractor's ability to maintain and support the System, shall ***not*** be considered upgrades or Enhancements that shall be paid for by the NHDOT.

Upgrades and Enhancements required for reasons such as to meet major changes to standards, statutes or interoperability requirements or the addition of new functionality; or, that provide the NHDOT with a demonstrable benefit in performance, costs or productivity, shall be proposed by the Contractor in accordance with the requirements of the NHDOT's Change Request process and coordinated through the NHDOT and the New Hampshire Office of Information Technology.

C-8.4.7. Notifications

The Contractor shall follow the required response and coverage times as specified in this RFP. The Contractor shall utilize MOMS to the fullest extent possible to automate the process of handling Alerts, Notifications and Communications for work orders and calls for service. The Contractor shall designate Maintenance Technicians and Staff to be "On-Duty" for specific time periods based upon a resource schedule. The Maintenance Person that is On-Duty shall receive all MOMS automated notifications or e-mails and/or text messages containing alerts of notification of problems or events. The person On-Duty shall then perform all required processes and responses to effect the analysis of the event, trouble shooting and remediation of the problem and/or repair of the system to make the TCS fully functional for revenue collection.

C-8.4.8. Recording of Maintenance Activities

In all cases, it shall be the Contractor's responsibility to log all reported Maintenance activities. The Contractor shall also document all information and issues related to a fault condition. The Contractor shall develop a report on the MOMS that can be identified by its unique tracking number and acquired through any variable associated with the report. For example, the report should be able to be queried via specific aspects such as location, component, or corrective action. This document shall be the mechanism by which an individual problem is tracked to completion. The document shall be identified as a Trouble Failure Report (TFR). The TFR shall contain as much information as possible in order for any person to reasonably determine the fault, when it was worked on, the corrective action, and any other information pertaining to the individual Maintenance event. Items to be contained on the TFR include:

1. Applicable Date / Time blocks (received, response, repair, closed out);
2. Location of fault (tolling location, lane, subsystem, etc);
3. Failure component;
4. All codes and alerts associated with the failure;
5. Detailed description of corrective action;
6. Technician (s) who worked on the fault condition;
7. Serial number of failed component and any replacement components;
8. Notification date/time, arrival on site date/time, and repair complete date/time; and
9. Any other blocks or fields deemed necessary to adequately track and describe the Maintenance action.

Standard definitions and terminology shall be established to encourage consistency and limit discrepancies between reports. Specifically, if pull-down menus or similar selections are made available to the technician for input of items such as corrective action, each option should be clearly defined and its intended use must be defined in the technician training materials. The goal of this standard shall be to establish a consistent and traceable reporting of activities.

It is the Contractor's responsibility to ensure that their Maintenance staff has real time access to the MOMS and all the required connections are established and ongoing to ensure that the Maintenance staff maintains access, including required remote units.

C-8.5. Spare Parts

The Contractor shall be responsible for the complete supply chain of spare parts inventory to maintain the new TCS. The scope of spare parts shall include all parts currently in inventory to be delivered by NHDOT as the Contractor takes over interim maintenance of the existing TCS as well as any new spare parts to be purchased for supporting the New

TCS. NHDOT shall bear the cost and ownership of all spare parts (outside of warranty). The Contractor shall submit a budgetary line item for spare parts new TCS supported by a detailed list of the parts and the subsystem to which they belong.

C-8.5.1. Spare Part Inventory and Tracking

Faulty components or parts will be returned to the manufacturer for repair or replacement as soon as possible after a failure occurs. Components that are under warranty will be expedited for repair before the warranty period expires. Parts and components that have been repaired by either the manufacturer or third party shall be checked for quality when received, entered into MOMS and placed back in inventory.

C-8.5.2. Procurement and Control of Spare Parts

The Contractor shall utilize the functionality of MOMS to maintain, control, track and purchase all inventory related to spare parts for the TCS and all toll related equipment. The Contractor shall store and control all spares and asset inventory in a safe and secure manner.

C-8.5.3. Inventory Management

All spare parts and asset inventory of equipment shall be performed through MOMS. When spare parts inventory reach a configurable threshold, automatic replenish alerts shall be generated. The Contractor shall work with NHDOT to determine the asset levels for inventory.

C-8.6. Cooperation with Other Contractors and Providers

The Contractor may be required from time to time to work with or other vendors or providers in order to support the TCS. The Contractor shall cooperate to the fullest extent with any other vendor or provider in order to ensure that the TCS and other functional elements of the TCS do not conflict or cause any deterrent in capability or service to the traveling public or the NHDOT.

C-8.7. Emergency Response Management

The Contractor shall immediately respond to any emergency situation that may arise that has already or could potentially damage the TCS. The Contractor shall be prepared to put forth all necessary resources to divert or correct an emergency condition. Such emergency conditions shall be handled in accordance with policies and procedures established and Approved by the NHDOT. The following are a few examples of emergency conditions:

1 Weather related

2 Vehicle accident

3 Third party (power outage)

4 Vandalism

C-8.8. Incident and Revenue Loss Reporting

The Contractor shall immediately notify the NHDOT of any incident whereby loss of revenue has occurred or could potentially occur. The Contractor shall take immediate action to rectify the condition and return the TCS to normal functioning. An Incident Report shall be provided to the NHDOT. If the condition is determined to be due to the fault of the Contractor, damages and costs shall be the responsibility of the Contractor as set forth in this Contract.

C-8.9. Maintenance Staffing, Materials and Training

The Contractor shall at its own expense provide all personnel necessary to perform the Maintenance Services required in this RFP. Staffing shall include all human resources necessary to manage and administrate the field maintenance force. The Contractor shall provide all materials necessary for maintenance personnel including but not limited to: Vehicles, tools and equipment, uniforms, computing and communications devices and facilities for central repair depot or maintenance office.

C-8.9.1. Maintenance Staffing Requirements

All personnel engaged in the maintenance, repair and troubleshooting shall be qualified, properly licensed, OSHA safety trained and authorized under all applicable laws and regulations both local and national.

The State may conduct reference and background checks on all Maintenance Staff under this Agreement. The NHDOT reserves the right to reject any of the Contractor's assigned Staff as a result of such reference and background checks

C-8.9.2. Tools and Materials

The Contractor shall provide all tools, vehicles, training, and any other materials required to maintain the TCS to the operating levels required in this RFP.

C-8.9.3. Personnel Training

The Contractor shall train personnel up to their level of their responsibility. Training shall be comprehensive so that personnel have full comprehension of the overall TCS operation including lane, plaza, Host, ORT Host and E-ZPass Interagency functions and supporting

infrastructure. Training shall also include OSHA required safety training for all potential hazards on the job.

C-8.9.4. Training Materials and Ongoing Education

The Contractor shall provide professional quality training materials including manuals; videos, computer based training and "hands-on" demonstrations. The Contractor shall provide refresher and remedial training, continuing education, as necessary and required.

C-8.9.5. Training Program

Training programs shall be developed "in-house" by the Contractor or by an accredited or certified third party educational company, community college or vocational technical school.

C-8.9.6. Training Records

The Contractor shall maintain training records in employee personnel files and make the information available as part of the yearly reporting to NHDOT.

C-8.10. Safety

The Contractor shall adhere to all applicable safety standards and guidelines for working on or around construction zones, energized equipment, active roadways, and a Maintenance environment, including but not limited to the following:

1. NHDOT safety procedures and guidelines
2. State of New Hampshire safety procedures and guidelines (Department of Labor)
3. OSHA
4. NEMA
5. NEC
6. FHWA
7. Any other local, state, or Federal ordinance, procedure, or guideline that provides for a safe operation and working environment.

C-8.11. Maintenance and Protection of Traffic

The Contractor shall provide any and all required maintenance of traffic related to lane closures for the maintenance of the TCS. Through the coordination of proposed maintenance of traffic planning as part of the Maintenance Plan development, a detailed procedure for notifying maintenance of traffic for Maintenance activities shall be developed by the Contractor. The Contractor shall coordinate with NHDOT for the performance of all maintenance of traffic. Advanced planning shall be required to determine detailed procedures for the request for and coordination of maintenance of

traffic. Contractor shall work with NHDOT to develop as a part of the Maintenance Plan described above a maintenance and protection of traffic coordination procedure for approval by the NHDOT.

Contractor shall adhere to the Approved Maintenance Of Traffic (MOT) Plan when setting up, working under MOT and restoring lanes to traffic. Contractor shall also work with the NHDOT to coordinate MOT work and to adhere to the NHDOT advance notice requirements for work in the lanes, both on a scheduled and emergency basis.

As a basis for determining MOT procedures the following are the current guidelines for toll lane closures:

- The lane canopy light shall be turned to red.
- Cones shall be tapered into a "V" format in front of the toll lane.
- A 4' by 4' lane closed sign shall be placed at the beginning of the lane closure (see sample below).

 Vendor Initials_____

Date_____

C-8.12. Reporting Requirements

The NHDOT and/or its representative shall have access to all Maintenance and service records at all times for review and audit.

C-8.12.1. Field and Shop Maintenance Records

The Contractor's Maintenance Manager shall maintain current, complete, and accurate records for all field and shop Maintenance activities. The System shall generate a Trouble Failure Report (TFR) every time a Maintenance service (corrective or emergency) is performed. All preventative and predictive Maintenance activities shall be reported in the same manner as corrective or emergency Maintenance activities. The information shall be contained on the MOMS database.

The MOMS shall generate a summary report related to all Maintenance activities over a specified time period. This report shall include, but not limited to:

1. Type of notification
2. System failure (Lane, Host, Network)
3. Location ID
4. Lane #, if applicable
5. Equipment failure and description
6. Work or service performed
7. Parts replaced, including serial numbers and other descriptions
8. Dates and times the action started and completed

This summary report shall be generated monthly and distributed to the NHDOT.

C-8.12.2. Maintenance Summary Reports

The Contractor shall provide summary reports for the following reports to the NHDOT on a monthly basis and be readily available in detail or summary format over the network to the NHDOT personnel on a daily, weekly or any time period determined by the NHDOT:

1. Average time to respond and time to repair for the preceding weeks Maintenance activities
2. Time to respond exceeding the allowed maximum. Each item shall be detailed with a description as to why the maximum times were not adhered with and any corrective actions to ensure these do not continue.
3. Time to respond and repair exceeding the allowed maximum. Each item shall be detailed with a description as to why the maximum times were not adhered with and any corrective actions to ensure these do not continue.
4. Total down time of any lane or equipment for the preceding week
5. Lane availability, weekly
6. System availability, weekly
7. Equipment availability, weekly

8. Detailed list of parts replaced as a result of Maintenance actions
9. Status of removed parts and equipment (System generate part numbers, being repaired in Maintenance shop/TOCC, purchase replacement part, etc).
10. Trend analysis of repetitive failures
11. Status of spare parts inventory
12. Personnel staffing and issue

C-8.12.3. Additional Summary Reports

The Contractor shall provide the NHDOT with any additional reports it may require in order to determine that the System is operationally sound, functionally efficient, and being maintained to the expected level. The Contractor shall provide all available resources in order to collect data and prepare the required reports.

C-8.13. On-Site Documentation

The Contractor shall maintain one (1) full set of all TCS documentation including, but not limited to, as-built drawings, toll equipment service manuals, computer manuals, financial audit and control manual, parts inventory lists and other data as may be required for record purposes In addition, one (1) set of complete documentation shall be maintained at the Contractor's home office and one (1) set of complete documentation shall be maintained at the NHDOT's Headquarters.

The Contractor shall furnish all Maintenance personnel with appropriate System documentation as may be required to perform their respective duties. All System documentation shall be serially numbered and the assignment of all documentation to Maintenance personnel shall be recorded at the existing onsite location of the Contractor's local Maintenance support. The Contractor shall provide to the NHDOT a list of documentation assigned to Contractor personnel which shall be updated quarterly.

The documentation provided and/or assembled for the TCS or Enhancements to the existing system to support the TCS shall be considered highly confidential. The Contractor's employees shall not reproduce the documentation or discuss the contents of the documentation with the NHDOT toll collectors or other unauthorized personnel.

The NHDOT will make available to the Contractor any relevant documentation that it maintains and that will assist in the Maintenance of the TCS. However, the NHDOT will not guarantee the sufficiency, accuracy, or adequacy of any documentation provided.

The Contractor shall keep all documentation provided by the NHDOT current and usable for Maintenance of the TCS.

C-8.14. Maintenance Performance Requirements

C-8.14.1. Maintenance Coverage

Maintenance Services shall be provided on a 24/7 basis. The 24/7 coverage shall be a combination of direct on site work hours and on call availability. The Contractor shall provide on site personnel to the extent required to meet the Maintenance response times and any required preventative, predictive and corrective maintenance procedures. During those hours that a maintenance technician is not physically on site, coverage shall be performed via an on call basis.

The Contractor shall make every attempt to schedule potential lane closure requirements outside of the peak traffic periods. The Contractor shall coordinate directly with the Supervisor and or toll operations staff in performance of maintenance activities.

In the event extended lane closures will be required to complete certain installation or Maintenance actions, such actions may have to be accomplished during night time hours. All lane closures are subject to the approval of the NHDOT.

The Contractor shall post a weekly schedule identifying personnel and times of who will be available on site for Maintenance activities. The schedule will also identify the personnel and times of who will be assigned on call for Maintenance activities. The Contractor shall provide to the NHDOT on a regular basis the updated schedule, active personnel list, and contact information.

Response and repair times for every Maintenance event shall be recorded and reported by the MOMS. Maintenance Response and Repair Times shall be provided in accordance with the reporting requirements of the Contract. The new MOMS shall be utilized that provide comprehensive reporting package that validates the Contractor performance is in conformance with these Technical Requirements. The Contractor shall be accountable for meeting the response and repair times specified in this Contract, Required Performance and Penalties Summary. Failure to meet the response and repair time criteria described above shall result in a penalty as specified in these Technical Requirements and in the terms of the Contract.

C-8.14.2. Performance Reviews

The NHDOT will conduct a review of the Contractor's performance on a monthly basis, utilizing all required System reports provided by the Contractor and reports generated and created by the MOMS and Host System. Performance reviews shall begin one (1) month after commencement of Maintenance and Software Support Services and will provide evaluation of the previous month of operation. Liquidated damages shall not begin to be assessed until the sixth month following the commencement of the Maintenance and Support Services, for the previous (fifth) month's performance.

C-8.14.3. Required Performance and Liquidated Damages Summary

Contractor shall be required to meet Maintenance performance requirements that are detailed in this section. In addition to the NHDOT's other rights and remedies, the NHDOT may assess liquidated damages for failure to perform these Maintenance services, including, but not limited to, system performance, availability and mean time between failures, as further described in the in Table 8-3 and detailed further below.

Table 8-3 Summary Maintenance Performance Requirements and Parameters

Performance Parameter	Sub-function	Performance Standard	Liquidated Damages
1. **Time to Acknowledge**	All Mission Critical Events	Acknowledge receipt of failure or priority event within one (1) hour	$250 per occurrence
2. **Individual Maintenance Event Repair Time**	All Priority Events	Based on priority levels.	$250 per hour per lane during peak hours and $125 per hour per lane off-peak as defined in this document.
3. **Mean Time to Respond and Repair (MTTRR)**	Mission Critical Response and Repair Time	1 hour to Respond and 2 hours to Repair.	$500 per occurrence For every additional delay of 24 hours an additional $100 per occurrence
	High Priority Response and Repair Time	4 hours to Respond and 24 hours to Repair	$300 per occurrence For every additional delay of 24 hours an additional $100 per occurrence
	Medium Priority Response and Repair Time	8 hours to respond and 2 business days to repair.	$100 per occurrence For every additional delay of 24 hours an additional $100 per occurrence
4. **Mean Time Between Failures**	Mean Time Between Failures for each Deployed subsystems		$500 for each subsystems not meeting requirement

Performance Parameter	Sub-function	Performance Standard	Liquidated Damages
5. **Availability**	Deployed Lanes Availability	99. 5% Availability	$500 for every .1% below requirement
	System Availability (TCS Host CPS and network)	99.9% Availability	$500 for every .1% below requirement
6. **TCS Host CPS Processing**	Transaction/Image Processing	All lane transactions posted to the TCS Host database within one (1) calendar day of occurrence All transactions and images transmitted to the IAG CPS/VPC within one (1) calendar day of occurrence (except for force majeure events)	$50 per day delayed per 1,000 transactions
	Transponder Status File Processing	All Transponder Status Files shall be transmitted to the lane controllers within one (1) hour of receipt	

In the event liquidated damages are assessed the NHDOT will deduct these from the monthly maintenance invoice.

In addition to the NHDOT's other rights and remedies, the Contractor shall also be responsible for damages associated with the loss of data and/or revenue for the failure of NHDOT's System. Such damages would include and are not limited to resources expended by the NHDOT resulting from failure of the NHDOT's TCS as well as the value of any such lost data or revenue. Because this amount cannot be readily determined liquidated damages shall be assessed for such failure. For every day in which the System fails to operate and revenue and/or data is lost due to the actions or inactions of Contractor, an amount equal to one thirtieth (1/30) of the monthly Maintenance fee and all lost revenue associated with the failure shall be assessed as liquidated damages against the Contractor. Revenue loss will be determined by the NHDOT, using data for comparable time periods where such loss cannot otherwise be directly determined.

Reports shall be developed by the Contractor to measure whether the performance standards have been met. Where reports are used to measure performance, reports shall be generated by Contractor and provided to the NHDOT on a monthly basis, unless otherwise specified in the Contract. The reports shall be in a format approved by the NHDOT. The NHDOT shall have the right to audit Contractor and system records, date and reports to verify the accuracy of information provided, and if a discrepancy is found the Contractor shall pay the audit expenses.

C-8.15. Security

All Contractor's personnel shall be subject to appropriate security and background checks to the satisfaction of the NHDOT. The Contractor shall obtain Approval from the NHDOT for all service personnel. Contractor's personnel shall be issued NHDOT identification badges, and shall wear such identification badges at all times when on NHDOT property. Use of such identification badges for purposes other than work associated with the Contract will result in termination of the employee from the Contract, and possible other legal or disciplinary action.

The services and work performed under the Contract are considered highly confidential. All employees of the Contractor shall not discuss their work with the NHDOT toll collectors, with other unauthorized personnel, or any individuals not directly associated with the NHDOT. Contact with Toll Collectors shall be limited to problem data gathering only and not solution audit information.

The NHDOT will identify and designate primary points of contact for the Contractor communications. Under most circumstances, the Contractor shall limit communication with the NHDOT to the NHDOT's designated points of contact.

Discussion of any services or work performed on the NHDOT toll system with the media, in oral presentations, in written publications or in any other form must be approved in advance by the NHDOT.

C-8.16. Confidentiality

The Contractor shall keep all information regarding its activities pursuant to the TCS confidential and shall communicate such information only with authorized the NHDOT personnel or the NHDOT designated representatives.

 Vendor Initials_____

Date_____

APPENDIX D: TOPICS FOR MANDATORY NARRATIVE RESPONSES

Vendors must provide narrative responses to each of the information requests and questions listed below. These responses should be included in Section IV of the Proposal and should be identified by the sub-section (question) numbers referenced below:

D-1 Equipment Reuse/Transition Plan

With the understanding that the primary objective is provide a cost effective and reliable solution to both maintenance and upgrades to the current TCS, please provide details as to your proposed approach for establishing and carrying out maintenance activities while at the same time providing TCS upgrades, replacement and/or modifications. Details shall specifically address such issues as equipment reuse, replacement and subsequently the plan for future replacement of reused equipment to maintain adequate system availability.

D-2 System functionality

Describe the proposed TCS software and hardware design and how it addresses the goals of this procurement, both from a sustainable maintenance perspective as well as technical adequacy. Specific areas to address shall include:

- Lane level functionality, integration and improvements.

Plaza level functionality, integration and improvements.

- VES subsystem replacement details and TCS/CSC integration. Also include details on image quality and supplemental lighting requirements.

D-3 AVC

With the understanding that certain lane hardware shall be reused, describe your proposed vehicle classification subsystem design and/or logic and how it will achieve the Agency's accuracy requirements. Describe how the proposed classification subsystem addresses the requirement to classify dual tire vehicles including processing rules and any perceived challenges.

D-4 System Redundancy

Describe how the redundancy requirements related to vehicle detection are met and how the AVDC System will function in a degraded mode operation.

D-5 Physical Changes

Provide drawings or schematics for all lane modes that detail any new or proposed changes to current equipment and components with respect to mounting requirements, including equipment/component layout within the lane, booth and or plaza.

D-6 Integration with Future Readers

Provide details as to the TCS's adaptability for future integration of the Kapsch JANUS® reader, including multi-protocol readers.

D-7 Degraded mode operation

For each of the lane modes of operation describe how the TCS lane subsystem(s) will operate in degraded mode and or levels of degraded mode. Specifically, detail how the TCS will operate to ensure accuracy and accountability of revenue if a failure of such items as overhead scanners, ETC subsystem, lane controller, VES subsystem, etc. occurs.

D-8 DVAS Solution

Provide details on the proposed DVAS solution. Specifically its ability to be integrated with the TCS, user interface, and general capabilities and installation requirements. Provide details on challenges and or expectation related to required bandwidth and networking improvements, which may be required to support DVAS. Discuss potential impacts on maintenance services if the DVAS option is exercised.

D-9 MOMS Implementation

Discuss your proposed Maintenance-On-Line Management System (MOMS) and explain how equipment and process failures of the TCS will be tracked through MOMS in real time. Further explain how, through the use of MOMS and established procedures the Contractor would address and rectify issues/problems.

D-10 Network Architecture Drawings

Provide drawings or schematics detailing the network architecture layout, including all connections to external interfaces and existing toll collection system components. Also provide a narrative discussion on the estimated and proposed (if necessary) changes to the network architecture including bandwidth requirements.

D-11 UL Requirements

Discuss your understanding and approach to ensuring UL compliance for any new and or future work to be completed under this contract. Particular attention should be paid to ensuring integrated or combined components meet UL requirements.

D-12 Financial Reconciliation of Transactions

Provide sample transactional and financial reconciliation and audit reports that demonstrate how the Agency will reconcile and report transactions, including those to external entities. Specific focus shall also be on attendant/lane audit with and without use of the DVAS.

D-13 Premature Vehicle Exits

Discuss your approach in handling vehicles that exit before the toll attendant has processed the transaction on the toll terminal.

D-14 Test Plan

Discuss your test plan approach; how system testing is expected to be performed. Specify what tests, test functions, and test methods are envisioned to ensure the TCS meets the requirements of the

Agency. Also, please discuss your requirements for on-site testing, including a proposed test track and any required resources, expectations and participation by the Agency.

D-15 Software Warranty/Maintenance

Describe your approach to providing TCS software Warranty and Maintenance. Define what basic software maintenance is included in the annual maintenance cost and further what upgrades and enhancements are to be included in the annual maintenance cost. Additionally, describe specifically what upgrades or enhancements would not be included in the annual maintenance cost and would be subject to a change order to the Contract.

D-16 Software Ownership

Describe your proposed terms and conditions for ownership or licensing of the System Software given the Agency's requirements noted Appendix H of the RFP. Contractors should be aware that the Agency's ability to own, operate, maintain and adapt the Software beyond the base requirements will be an evaluation criteria. Specifically address:

What Software, if any, will be provided to the Agency with a perpetual, royalty free, non-exclusive license to allow the Agency to use, operate translate, reproduce, modify (including potential modification and/or maintenance by a third party), and adapt for its own purposes upon any event of termination, cancellation or conclusion of the Contract?

What System Software, if any, including that developed exclusively for the Agency will be owned by the Agency?

What third party Software is being proposed?

D-17 Transition Plan

Provide a detailed proposed Transition Plan and Implementation Schedule for the Project, representing both the interim maintenance activities (including transition), design, development and deployment of the new TCS and continued maintenance (including system upgraded) for the initial five (5) year term. Particular focus shall be paid to the Contractor's proposed transition from the legacy system to the new TCS over the five (5) year contract term addressing component replacement, expected life cycle, etc.

D-18 Documentation

With consideration of the delivery deadlines and potential penalties for late delivery, provide details on your document management approach to ensure timely submittal of documentation.

D-19 Timely Delivery

Specifically address the key elements of the Transition Plan and Implementation Schedule provided in response to the above question.. Discuss the approach to delivering the System in the timeframe specified, highlighting the major challenges and issues and how these will be addressed. Wherever possible, discuss examples of previous projects your team has worked on where similar challenges were encountered and how they were addressed. Discuss what efforts are required of the Agency or other third parties in order to meet the required opening date and what conditions, if any, must be met in order to meet the opening date.

D-20 Challenges/Out of Scope Items

In regards to both TCS deployment and maintenance efforts discuss the challenges and or any concerns for out of scope items.

D-21 Bill of Materials

For any proposed new equipment provide a preliminary Bill of Materials (BOM) and specification "cut" sheets for each component, including enclosures.

D-22 Maintenance Approach

Specific to maintenance of the new TCS, describe your general anticipated Maintenance approach including staffing to meet the requirements of this RFP. This discussion should include such topics as anticipated staffing levels, geographic locations, headquartered locations (home base for technician staff)

D-23 Maintenance Scalability

With the understanding that the Agency may elect to increase or decrease the number of active toll lanes over the course of the contract, provide a proposed approach in determining how the annual maintenance cost may be adjusted to reflect the change in lane quantity to be maintained.

D-24 System Scalability

Describe the TCS's design and ability to adapt to the addition or reduction in lanes and or plaza facilities. What is the required level of effort and resources?

D-25 Security

Please provide a plan outlining the security features of your proposed solution. This plan should include, but not be limited to the following topics.

- How do you plan to secure both wired and wireless implementations?
- What level encryption do you plan to implement on the wired and wireless implementation?
- How are end-users and administrators authenticated to your product?
- How do end-users and administrators gain access to reports, data sets, etc. (e.g. via roles)?
- Fully describe how reports and data are protected from unauthorized users.
- Describe how row-level access to the data is attained?
- What level of encryption is used on passwords, data, reports, etc.?
- How will your architecture interface with the State firewall?
- How does any web-based client differ in terms of security from the standalone client?
- Virus protection plan?
- How will your proposed solution be isolated from your other customers?
- How do you identify and address security violation or intrusions?

APPENDIX E: STANDARDS FOR DESCRIBING VENDOR QUALIFICATIONS

Vendor qualifications are important factors in selecting Software and accompanying Implementation and follow on support Services. To facilitate evaluation of Vendor qualifications, the State seeks information about:

(1) corporate qualifications of each Vendor proposed to participate in the Project,
(2) proposed team organization and designation of key staff,
(3) individual qualifications of candidates for the role of Project Manager, and
(4) individual qualifications of candidates for other key staff roles.

This appendix identifies specific information that must be submitted.

E-1 Required Information on Corporate Qualifications

Information is required on all Vendors who will participate in the Project. Vendors submitting a Proposal must identify any Subcontractor(s) to be used.

E-1.1 Vendor and Subcontractors

The Vendor submitting a Proposal to this Project must provide the following information:

E-1.1.1 Corporate Overview

Using Form 1 in Appendix I, Vendor and Subcontractor Information Statement, provide the requested information for the Vendor and all Subcontractors.

E-1.1.2 Financial Strength

Provide at least one of the following:

1 The current Dunn & Bradstreet report on the firm; or
2 The firm's two most recent audited financial statements; and the firm's most recent un-audited, quarterly financial statement; or
3 The firm's most recent income tax return. For example, either a copy of the IRS Form 1065, U.S. Return of Partnership Income or Schedule E (IRS Form 1040) Supplemental Income and Loss (for partnerships and S corporations) OR IRS Form 1120, U.S. Corporation Income Return. These forms are typically submitted when a Vendor does not have audited financial statements.

E-1.1.3 Litigation

Identify and describe any claims made by clients during the last ten (10) years. Discuss merits, current status and, if available, outcome of each matter.

E-1.1.4 Prior Project Descriptions (3 limited to 3 pages each)

Provide descriptions of no more than three (3) similar projects completed in the last five (5) years (See form in Appendix I). Each project description should include:

1. An overview of the project covering type of client, objective, project scope, role of the firm and outcome;
2. Project measures including proposed cost, actual project cost, proposed project schedule and actual project schedule;
3. Names and contact information (name, title, address and current telephone number) for one or two references from the client; and
4. Names and project roles of individuals on the proposed team for the New Hampshire Project that participated in the project described

E-1.1.5 Subcontractor Information

Vendors must use Form 1 (Appendix I) to provide information on any Subcontractors proposed to work on this Project. Required information shall include but not be limited to:

1. Identification of the proposed Subcontractor and a description of the major business areas of the firm and their proposed role on the Project.
2. A high-level description of the Subcontractor's organization and staff size.
3. Discussion of the Subcontractor's experience with this type of Project;
4. Resumes of key personnel proposed to work on the Project; and
5. Two references from companies or organizations where they performed similar services (if requested by the State).

E-2 Team Organization and Designation of key Vendor staff

Provide an organizational chart depicting the Vendor Project team and Project organization. This chart shall identify specific key staff of the Vendor, any Subcontractors, and the Agency roles and shall identify all positions at least one (1) level below key staff.

Define the responsibilities, length of assignment, the percentage of time that the resource will be dedicated to this Project for that length of assignment and whether the resource is local (does not require travel expenses when working on the Project) for each of the roles depicted in the organizational chart. Key staff who must be identified by name include:

- Project Principal;
- Project Manager;
- Quality Assurance Manager;
- Assistant Project Manager;
- Installation Manager; and
- Maintenance Manager.

A single team member may be identified to fulfill the staff requirement in multiple areas, with the exception of Project Manager.

E-2.1 State Staff Resource Worksheet

Append a completed State Staff Resource Worksheet to coverage of organization. The required format follows.

Table E-2: Proposed State Staff Resource Hours Worksheet

State Role	Initiation	Configuration	Implement.	Project Close Out	Total
Project Manager					
Position 1					
Position 2					
Position 3					
Position 4					
Position 5					
State Total					

 Vendor Initials_____

Date_____

E-3 Candidates for Project Manager

Qualifications of the Project Manager are particularly critical. Therefore, the Agency requires that the Project Manager be clearly identified.

The Agency requires that the Project Manager and Installation Manager be assigned full time, on site for the duration of installation of the Project. The Maintenance Manager shall be assigned full time, onsite from go live through Provisional Project Acceptance.

For the Project Manager candidate, provide a resume not to exceed three (3) pages (does not count towards overall page limit) in length addressing the following:

- The candidate's educational background;
- An overview of the candidate's history;
- The candidate's project experience, including project type, project role and duration of the assignment;
- Any significant certifications held by or honors awarded to the candidate; and
- At least three (3) references, with contact information that can address the candidate's performance on past projects.

E-4 Candidates for other key Vendor staff Roles

Provide a resume not to exceed two (2) pages (does not count towards overall page limit) in length for each key Vendor staff position on the Project team. Each resume should address the following:

- The individual's educational background;
- An overview of the individual's history;
- The individual's project experience, including project type, project role and duration of the assignment;
- Any significant certifications held by or honors awarded to the candidate; and
- At least three (3) references, with contact information, that can address the individual's performance on past projects.

APPENDIX F: PRICING WORKSHEET INSTRUCTIONS

A Vendor's Cost Proposal must be based on the worksheets formatted as described in this appendix.

F-1 Activities/Deliverables/Milestones Pricing Worksheet – Deliverables List

See *Appendix C: Requirements and Deliverables* for deliverable Payment Schedule.

F-2 Proposed Position – Initial Contract Term Vendor Rates Worksheet

[See Pricing Worksheets in Appendix I for detail on the item]

F-3 Proposed Vendor Staff and Resource Hours Worksheet

[See Pricing Worksheets in Appendix I for detail on the item]

F-4 Price Proposal Instructions

General Instructions

The Proposed Price Proposal shall be completed in accordance with the following instructions:

1. The Proposed Price Proposal shall be submitted on the Price Proposal Forms included in RFP Appendix I.
2. The Price Proposal Forms shall constitute the full and complete Price Proposal for compensation for performance of the Contractor's obligations and Work under this Project.
3. The Price Proposal Forms must be completed in their entirety. The Price Proposal Forms for the Project are as follows:
    - Project Summary Sheet (Sheet 1)

- Detail Cost Sheets (Sheet 2), (2-1 thru 2-7):
    i. Sheet 2-1: Category A – Bond, Insurance and Software Escrow
    ii. Sheet 2-2: Category B – Toll Hardware
    iii. Sheet 2-3: Category C – Software Costs
    iv. Sheet 2-4: Category D – Civil and Electrical Design and Construction
    v. Sheet 2-5: Category E – Installation
    vi. Sheet 2-6: Category F – Warranty and Maintenance
    vii. Sheet 2-7: Category G – RFP Optional Items
- Direct Labor Rates (Sheet 3)
- Toll Equipment Life Cycle Table (Sheet 4). This table has also been provided within the RFP also but is again provided to assist in completion of the price sheets.

4. The Sheets in groups 1, 2 and 3 have a column for each of the five (5) years of the Contract. NHDOT expects the Contractor to establish a total life cycle cost for the entire TCS including new software and hardware replacement which shall then be broken down and allocated to the corresponding year for that element or item.
5. Do not fill in any grayed-out cells on the Price Proposal Forms nor make any other entry on or alteration to the Price Proposal Forms other than in accordance with these Price Proposal Instructions.
6. NHDOT may waive or correct any error appearing in the Price Proposal Forms if the correct amount can be clearly ascertained from the information provided; however, NHDOT is under no obligation to do so. In the event of an inconsistency between the amount stated in numbers and the amount stated in written words the amount stated in written words shall control. In the event of a mathematical miscalculation, the correct sum shall control.
7. An officer or an individual otherwise authorized in writing by an officer of the Proposer to sign the Contract must also sign and date each Price Proposal Sheet in the appropriately provided signature line. The Signatures shall indicate approval and commitment for the entire completed Price Proposal form.
8. All elements of the Price Proposal must be completed. If zero (0) quantities are included in the Proposal, a zero (0) must be entered into the corresponding cell. In addition, all items identified by NHDOT in the price sheets will be assumed to be included in the Proposal unless such items are specifically identified as an exception in Appendix I, Form 6: Compliance Matrix.
9. NHDOT reserves the right to reject the submittal if it is not completed in accordance with the instructions set forth herein.
10. Please review all terms and conditions of the Contract Documents, as well as these Price Proposal Instructions, prior to completing the Price Proposal Forms.

11. The Price Proposal Forms are provided in Excel format worksheets for ease of completion and checking. Instructions for completion of each of the Price Proposal Forms are provided in Sections 2 through 8 of these Price Proposal Instructions.
12. The Price Proposal Forms provided do not contain any preset formulas, calculations, macros, etc. The Proposer shall ensure that any and all formulas used in completing the forms are the sole responsibility of the Proposer and further that the NHDOT shall make no representations as to the accuracy of any formulas used.
13. When submitting in electronic form, the Proposer may submit in both Excel and PDF formats.
14. The Price Proposal shall be inclusive of all costs, fees and applicable taxes associated with the Project necessary to meet the requirements of the Project as described in the RFP including, but not limited to Appendix C of the RFP. No price escalation will be allowed above the cost provided on the Price Proposal Forms to complete the Work except as may be allowed for future deployments.

Instructions on Completing the Price Proposal Forms

1. The Price Proposal Forms are provided per the sheets listed above. The entire Price Proposal Form is comprised of four components: the Project Summary Sheet (Sheet 1); seven (7) supporting Detail Cost Sheets (Sheets 2-1 thru 2-7); a Direct Labor Rate Sheet (Sheet 3) and the Toll Equipment Life Cycle Table (Sheet 4).

2. The Project Summary Sheet is intended to represent a summary of the total project cost based on the costs provided from each of the supporting Detail Cost Sheets.

3. For Project Summary Sheet line items requiring Detail Cost Sheets, these have been labeled to identify the corresponding detail sheet.

4. Additional line items in the Project Summary Sheet do not require Detail Cost Sheets.

5. Proposers are required to verify for themselves that formulas and calculations are performing correctly.

6. The Direct Labor Rate Sheet will be used for cost determination in the event of any additional or out of scope work requested of or assigned to the Contractor.

Completion of Project Summary Sheet (Sheet 1)

The total price for the Project of the Contract shall be the aggregate of all line item costs included for each year of the contract Project Summary Sheet (Sheet 1). Sheet 1, Project Summary Cost, shall represent ALL costs associated with completing the scope of work as defined in Appendix C of this RFP.

The total cost shall include, without limitation, all overhead, burden, profit, taxes, duties, fees, Contractor-acquired permits, licenses, warranties and other items necessary for the Contractor to complete the Work. No price escalation will be allowed above the costs provided on the Price Proposal Forms to complete the Work.

As Sheet 1 is primarily a summary of the Detail Cost Sheets, the Proposer shall first begin by completing the Detail Cost Sheets (Sheets 2-1 thru 2-7).

1. For each of the Detail Cost Sheets, in the columns provided under each cost component, enter a description for each cost component in as much detail as space allows.
2. For each cost component, provide the lump sum or unit cost.
3. For each year of the initial contract (5 years), enter the expected component quantity and cost. For example, if it is expected that 5 workstations will be replaced in the 3rd year of the contract, then a quantity of 5 and the associated extended cost should be entered under the Year 3 column.
4. **Once all cost components have been clearly entered with corresponding units and extended cost, complete the total column for each component for all five (5) years of the contract.**
5. **Provide a subtotal cost for the Detail Cost Sheet.**
6. **Complete all remaining Detail Cost Sheets according to steps 1 through 5 above.**
7. **Complete the Summary Sheet by carrying forward the total values from each of the Detail Cost Sheets.**
8. **On the Direct Labor Rate Sheet (Sheet 3), provide the personnel category name and the associated fully burdened labor rate.**

9. **The Toll Collection System – Equipment Life Cycle Table (Sheet 4) is used to used by the Contractor**

APPENDIX G: CERTIFICATES

A. Certificate of Good Standing

As a condition of Contract award, the Vendor, if required by law, must furnish a Certificate of Authority/Good Standing dated after April 1, 2012, from the Office of the Secretary of State of New Hampshire. If your company is not registered, an application form may be obtained from:

Secretary of State
State House Annex
25 Capitol Street
Concord, New Hampshire 03301
603-271-3244
www.nh.gov

If your company is registered, a Certification thereof may be obtained from the Secretary of State.

Note: Sovereign states or their agencies may be required to submit suitable substitute documentation concerning their existence and authority to enter into a Contract

B. Certificate of Authority/Vote

The Certificate of Authority/Vote authorizes, by position, a representative(s) of your corporation to enter into an agreement or amendment with the State of New Hampshire. This ensures that the person signing the agreement is authorized as of the date he or she is signing it to enter into agreements for that organization with the State of New Hampshire

The officer's signature must be either notarized or include a corporate seal that confirms the title of the person authorized to sign the agreement. The date the Board officer signs must be on or after the date the amendment is signed. The date the notary signs must match the date the Board officer signs.

 Vendor Initials_____

Date_____

You may use your own format for the Certificate of Authority/Vote as long as it contains the necessary language to authorize the agreement signatory to enter into agreements and amendments with the State of New Hampshire as of the date they sign.

CERTIFICATE OF AUTHORITY/VOTE CHECKLIST

SOURCE OF AUTHORITY

Authority must come from the **governing body,** either:

(1) a **majority voted** at a meeting, or
(2) the body provided **unanimous consent in writing**, or
(3) the organization's **policy or governing document** (bylaws, partnership agreement, LLC operating agreement) authorizes the person to sign

SOURCE OF AUTHORITY WAS IN EFFECT ON DAY AGREEMENT OR AMENDMENT WAS SIGNED

Certificate must show that the person signing the contract **had authority when they signed the Agreement or Amendment,** either:

(1) Authority was **granted the same day** as the day the Agreement or Amendment was signed, or
(2) Authority was **granted after** the day the agreement or amendment was signed and the governing body ratifies and accepts the earlier execution, or
(3) Authority was **granted prior** to the day the agreement or amendment was signed and it has not been amended or repealed as of the day the contract was signed.

APPROPRIATE PERSON SIGNED THE CERTIFICATE

The person signing the certificate may be the same person signing the Agreement or Amendment only if the certificate states that the person is the **sole director** (for corps) or **sole member** (for LLCs).

APPENDIX H – STATE OF NEW HAMPSHIRE TERMS AND CONDITIONS

AGREEMENT

The State of New Hampshire and the Vendor hereby mutually agree as follows:

GENERAL PROVISIONS

1. IDENTIFICATION.

<table>
<tr><td colspan="2">1.1 State Agency Name</td><td colspan="2">1.2 State Agency Address</td></tr>
<tr><td colspan="2">1.3 Vendor Name</td><td colspan="2">1.4 Vendor Address</td></tr>
<tr><td>1.5 Vendor Phone Number</td><td>1.6 Account Number</td><td>1.7 Completion Date</td><td>1.8 Price Limitation</td></tr>
<tr><td colspan="2">1.9 Contracting Officer for State Agency</td><td colspan="2">1.10 State Agency Telephone Number</td></tr>
<tr><td colspan="2">1.11 Vendor Signature</td><td colspan="2">1.12 Name and Title of Vendor Signatory</td></tr>
<tr><td colspan="4">1.13 Acknowledgement: State of , County of</td></tr>
</table>

Vendor Initials_____

Date_____

On , before the undersigned officer, personally appeared the person identified in block 1.12, or satisfactorily proven to be the person whose name is signed in block 1.11, and acknowledged that s/he executed this document in the capacity indicated in block 1.12.
1.13.1 Signature of Notary Public or Justice of the Peace [Seal]
1.13.2 Name and Title of Notary or Justice of the Peace

1.14 State Agency Signature	1.15 Name and Title of State Agency Signatory

1.16 Approval by the N.H. Department of Administration, Division of Personnel (if applicable) By: Director, On:
1.17 Approval by the Attorney General (Form, Substance and Execution) By: On:
1.18 Approval by the Governor and Executive Council By: On:

2. EMPLOYMENT OF VENDOR /SERVICES TO BE PERFORMED. The State of New Hampshire, acting through the agency identified in block 1.1 ("State"), engages Vendor identified in block 1.3 ("Vendor") to perform, and the Vendor shall perform, the work or sale of goods, or both, identified and more particularly described in the attached EXHIBIT A which is incorporated herein by reference ("Services").

3. EFFECTIVE DATE/COMPLETION OF SERVICES.

3.1 Notwithstanding any provision of this Agreement to the contrary, and subject to the approval of the Governor and Executive Council of the State of New Hampshire, this Agreement, and all obligations of the parties hereunder, shall not become effective until the date the Governor and Executive Council approve this Agreement ("Effective Date").

3.2 If the Vendor commences the Services prior to the Effective Date, all Services performed by the Vendor prior to the Effective Date shall be performed at the sole risk of the Vendor, and in the event that this Agreement does not become effective, the State shall have no liability to the Vendor, including without limitation, any obligation to pay the Vendor for any costs incurred or Services performed. Vendor must complete all Services by the Completion Date specified in block 1.7.

4. CONDITIONAL NATURE OF AGREEMENT. Notwithstanding any provision of this Agreement to the contrary, all obligations of the State hereunder, including, without limitation, the continuance of payments hereunder, are contingent upon the availability and continued appropriation of funds, and in no event shall the State be liable for any payments hereunder in excess of such available appropriated funds. In the event of a reduction or termination of appropriated funds, the State shall have the right to withhold payment until such funds become available, if ever, and shall have the right to terminate this Agreement immediately upon giving the Vendor notice of such termination. The State shall not be required to transfer funds from any other account to the Account identified in block 1.6 in the event funds in that Account are reduced or unavailable.

5. CONTRACT PRICE/PRICE LIMITATION/ PAYMENT.

5.1 The contract price, method of payment, and terms of payment are identified and more particularly described in EXHIBIT B, which is incorporated herein by reference.

5.2 The payment by the State of the contract price shall be the only and the complete reimbursement to the Vendor for all expenses, of whatever nature incurred by the Vendor in the performance hereof, and shall be the only and the complete compensation to the Vendor for the Services. The State shall have no liability to the Vendor other than the contract price.

5.3 The State reserves the right to offset from any amounts otherwise payable to the Vendor under this Agreement those liquidated amounts required or permitted by N.H. RSA 80:7 through RSA 80:7-c or any other provision of law.

5.4 Notwithstanding any provision in this Agreement to the contrary, and notwithstanding unexpected circumstances, in no event shall the total of all payments authorized, or actually made hereunder, exceed the Price Limitation set forth in block 1.8.

6. COMPLIANCE BY VENDOR WITH LAWS AND REGULATIONS/ EQUAL EMPLOYMENT OPPORTUNITY.

6.1 In connection with the performance of the Services, the Vendor shall comply with all statutes, laws, regulations, and orders of federal, state, county, or municipal authorities, which impose any obligation

or duty upon the Vendor, including, but not limited to, civil rights and equal opportunity laws. In addition, the Vendor shall comply with all applicable copyright laws.
6.2 During the term of this Agreement, the Vendor shall not discriminate against employees or applicants for employment because of race, color, religion, creed, age, sex, handicap, sexual orientation, or national origin and will take affirmative action to prevent such discrimination.
6.3 If this Agreement is funded in any part by monies of the United States, the Vendor shall comply with all the provisions of Executive Order No. 11246 ("Equal Employment Opportunity"), as supplemented by the regulations of the United States Department of Labor (41 C.F.R. Part 60), and with any rules, regulations and guidelines as the State of New Hampshire or the United States issue to implement these regulations. The Vendor further agrees to permit the State or United States access to any of the Vendor's books, records and accounts for the purpose of ascertaining compliance with all rules, regulations and orders, and the covenants, terms and conditions of this Agreement.

7. PERSONNEL.
7.1 The Vendor shall at its own expense provide all personnel necessary to perform the Services. The Vendor warrants that all personnel engaged in the Services shall be qualified to perform the Services, and shall be properly licensed and otherwise authorized to do so under all applicable laws.
7.2 Unless otherwise authorized in writing, during the term of this Agreement, and for a period of six (6) months after the Completion Date in block 1.7, the Vendor shall not hire, and shall not permit any subcontractor or other person, firm or corporation with whom it is engaged in a combined effort to perform the Services to hire, any person who is a State employee or official, who is materially involved in the procurement, administration or performance of this Agreement. This provision shall survive termination of this Agreement.
7.3 The Contracting Officer specified in block 1.9, or his or her successor, shall be the State's representative. In the event of any dispute concerning the interpretation of this Agreement, the Contracting Officer's decision shall be final for the State.

8. EVENT OF DEFAULT/REMEDIES.
8.1 Any one or more of the following acts or omissions of the Vendor shall constitute an event of default hereunder ("Event of Default"):
8.1.1 failure to perform the Services satisfactorily or on schedule;
8.1.2 failure to submit any report required hereunder; and/or
8.1.3 failure to perform any other covenant, term or condition of this Agreement.
8.2 Upon the occurrence of any Event of Default, the State may take any one, or more, or all, of the following actions:
8.2.1 give the Vendor a written notice specifying the Event of Default and requiring it to be remedied within, in the absence of a greater or lesser specification of time, thirty (30) days from the date of the notice; and if the Event of Default is not timely remedied, terminate this Agreement, effective two (2) days after giving the Vendor notice of termination;
8.2.2 give the Vendor a written notice specifying the Event of Default and suspending all payments to be made under this Agreement and ordering that the portion of the contract price which would otherwise accrue to the Vendor during the period from the date of such notice until such time as the State determines that the Vendor has cured the Event of Default shall never be paid to the Vendor;
8.2.3 set off against any other obligations the State may owe to the Vendor any damages the State suffers by reason of any Event of Default; and/or
8.2.4 treat the Agreement as breached and pursue any of its remedies at law or in equity, or both.

9. DATA/ACCESS/CONFIDENTIALITY/ PRESERVATION.
9.1 As used in this Agreement, the word "data" shall mean all information and things developed or obtained during the performance of, or acquired or developed by reason of, this Agreement, including, but not limited to, all studies, reports, files, formulae, surveys, maps, charts, sound recordings, video recordings, pictorial reproductions, drawings, analyses, graphic representations, computer

programs, computer printouts, notes, letters, memoranda, papers, and documents, all whether finished or unfinished.
9.2 All data and any property, which has been received from the State or purchased with funds provided for that purpose under this Agreement, shall be the property of the State, and shall be returned to the State upon demand or upon termination of this Agreement for any reason.
9.3 Confidentiality of data shall be governed by N.H. RSA chapter 91-A or other existing law. Disclosure of data requires prior written approval of the State.

10. TERMINATION. In the event of an early termination of this Agreement for any reason other than the completion of the Services, the Vendor shall deliver to the Contracting Officer, not later than fifteen (15) days after the date of termination, a report ("Termination Report") describing in detail all Services performed, and the contract price earned, to and including the date of termination. The form, subject matter, content, and number of copies of the Termination Report shall be identical to those of any Final Report described in the attached EXHIBIT A.

11. VENDOR'S RELATION TO THE STATE. In the performance of this Agreement, the Vendor is in all respects an independent Vendor, and is neither an agent nor an employee of the State. Neither the Vendor nor any of its officers, employees, agents or members shall have authority to bind the State or receive any benefits, workers' compensation or other emoluments provided by the State to its employees.

12. ASSIGNMENT/DELEGATION/SUBCONTRACTS. The Vendor shall not assign, or otherwise transfer any interest in this Agreement without the prior written consent of the N.H. Department of Administrative Services. None of the Services shall be subcontracted by the Vendor without the prior written consent of the State.

13. INDEMNIFICATION. The Vendor shall defend, indemnify and hold harmless the State, its officers and employees, from and against any and all losses suffered by the State, its officers and employees, and any and all claims, liabilities or penalties asserted against the State, its officers and employees, by or on behalf of any person, on account of, based or resulting from, arising out of (or which may be claimed to arise out of) the acts or omissions of the Vendor. Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is hereby reserved to the State. This covenant in paragraph 13 shall survive the termination of this Agreement.

14. INSURANCE.
14.1 The Vendor shall, at its sole expense, obtain and maintain in force, and shall require any subcontractor or assignee to obtain and maintain in force, the following insurance:
14.1.1 comprehensive general liability insurance against all claims of bodily injury, death or property damage, in amounts of not less than $250,000 per claim and $2,000,000 per occurrence; and
14.1.2 fire and extended coverage insurance covering all property subject to subparagraph 9.2 herein, in an amount not less than 80% of the whole replacement value of the property.
14.2 The policies described in subparagraph 14.1 herein shall be on policy forms and endorsements approved for use in the State of New Hampshire by the N.H. Department of Insurance, and issued by insurers licensed in the State of New Hampshire.
14.3 The Vendor shall furnish to the Contracting Officer identified in block 1.9, or his or her successor, a certificate(s) of insurance for all insurance required under this Agreement. Vendor shall also furnish to the Contracting Officer identified in block 1.9, or his or her successor, certificate(s) of insurance for all renewal(s) of insurance required under this Agreement no later than fifteen (15) days prior to the expiration date of each of the insurance policies. The certificate(s) of insurance and any renewals thereof shall be attached and are incorporated herein by reference. Each certificate(s) of insurance shall contain a clause requiring the insurer to endeavor to provide the Contracting Officer identified in block 1.9, or his or her successor, no less than ten (10) days prior written notice of cancellation or modification of the policy.

 Vendor Initials_____

Date_____

15. WORKERS' COMPENSATION.
15.1 By signing this agreement, the Vendor agrees, certifies and warrants that the Vendor is in compliance with or exempt from, the requirements of N.H. RSA chapter 281-A ("Workers' Compensation").
15.2 To the extent the Vendor is subject to the requirements of N.H. RSA chapter 281-A, Vendor shall maintain, and require any subcontractor or assignee to secure and maintain, payment of Workers' Compensation in connection with activities which the person proposes to undertake pursuant to this Agreement. Vendor shall furnish the Contracting Officer identified in block 1.9, or his or her successor, proof of Workers' Compensation in the manner described in N.H. RSA chapter 281-A and any applicable renewal(s) thereof, which shall be attached and are incorporated herein by reference. The State shall not be responsible for payment of any Workers' Compensation premiums or for any other claim or benefit for Vendor, or any subcontractor or employee of Vendor, which might arise under applicable State of New Hampshire Workers' Compensation laws in connection with the performance of the Services under this Agreement.

16. WAIVER OF BREACH. No failure by the State to enforce any provisions hereof after any Event of Default shall be deemed a waiver of its rights with regard to that Event of Default, or any subsequent Event of Default. No express failure to enforce any Event of Default shall be deemed a waiver of the right of the State to enforce each and all of the provisions hereof upon any further or other Event of Default on the part of the Vendor.

17. NOTICE. Any notice by a party hereto to the other party shall be deemed to have been duly delivered or given at the time of mailing by certified mail, postage prepaid, in a United States Post Office addressed to the parties at the addresses given in blocks 1.2 and 1.4, herein.

18. AMENDMENT. This Agreement may be amended, waived or discharged only by an instrument in writing signed by the parties hereto and only after approval of such amendment, waiver or discharge by the Governor and Executive Council of the State of New Hampshire.

19. CONSTRUCTION OF AGREEMENT AND TERMS. This Agreement shall be construed in accordance with the laws of the State of New Hampshire, and is binding upon and inures to the benefit of the parties and their respective successors and assigns. The wording used in this Agreement is the wording chosen by the parties to express their mutual intent, and no rule of construction shall be applied against or in favor of any party.

20. THIRD PARTIES. The parties hereto do not intend to benefit any third parties and this Agreement shall not be construed to confer any such benefit.

21. HEADINGS. The headings throughout the Agreement are for reference purposes only, and the words contained therein shall in no way be held to explain, modify, amplify or aid in the interpretation, construction or meaning of the provisions of this Agreement.

22. SPECIAL PROVISIONS. Additional provisions set forth in the attached EXHIBIT C are incorporated herein by reference.

23. SEVERABILITY. In the event any of the provisions of this Agreement are held by a court of competent jurisdiction to be contrary to any state or federal law, the remaining provisions of this Agreement will remain in full force and effect.

24. ENTIRE AGREEMENT. This Agreement, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire Agreement and understanding between the parties, and supersedes all prior Agreements and understandings relating hereto.

 Vendor Initials_____

Date_____

H-25. GENERAL CONTRACT REQUIREMENTS

H-25.1 State of NH Terms and Conditions and Contract Requirements

The Contract terms set forth in Appendix H: State of New Hampshire Terms and Conditions shall constitute the core for any Contract resulting from this RFP.

H-25.2 Vendor Responsibilities

The Vendor shall be solely responsible for meeting all requirements, and terms and conditions specified in this RFP, its Proposal, and any resulting Contract, regardless of whether or not it proposes to use any Subcontractor.

The Vendor may subcontract Services subject to the provisions of the RFP, including but not limited to, the terms and conditions in Appendix H: State of New Hampshire Terms and Conditions. The Vendor must submit with its Proposal all information and documentation relating to the Subcontractor necessary to fully respond to the RFP, which must include terms and conditions consistent with this RFP. The Vendor shall remain wholly responsible for performance of the entire Contract regardless of whether a Subcontractor is used. The State will consider the Vendor to be the sole point of contact with regard to all contractual matters, including payment of any and all charges resulting from any Contract.

H-25.3 Project Budget/Price Limitation

The State has funds budgeted for this Project, subject to Appendix H: State of New Hampshire Terms and Conditions, Section 4: Conditional Nature of Agreement and Section 5: Contract Price/Price Limitation/Payment.

H-25.4 State Contracts

The State of New Hampshire intends to use, wherever possible, existing statewide software and hardware contracts to acquire supporting software and hardware. Where these differences are identified during the design process, the cost of owner supplied hardware or software shall be subtracted from the Contract value accordingly for the corresponding items.

H-25.5 Vendor Staff

In the Proposal the Vendor shall assign and identify a Project Manager and key Vendor staff, in accordance with the Requirements and Deliverables of Appendix C: System Requirements and Deliverables and Appendix E: Standards for Describing Vendor Qualifications.

The Vendor's selection of a Project Manager will be subject to the prior approval of the State. The State's approval process may include, without limitation, at the State's discretion, review of the proposed Project Manager's resume, qualifications, references and background checks, and an interview. The Vendor's Project Manager must be qualified to perform the obligations required of the position under the Contract, have full authority to make binding decisions, and shall function as the Vendor's representative for all administrative and management matters. The Project

Manager must be available to promptly respond during Normal Working Hours within two (2) hours to inquiries from the State, and be at the site as needed. The Vendor must use his or her best efforts on the Project.

The Vendor shall not change key Vendor staff and Project Manager commitments (collectively referred to as "Project Staff") unless such replacement is necessary due to sickness, death, termination of employment, or unpaid leave of absence. Any such changes to the Vendor's Project Staff shall require the prior written approval of the State. Replacement Project Staff shall have comparable or greater skills with regard to performance of the Project as the staff being replaced and be subject to the provisions of this RFP and any resulting Contract.

The State, at its sole expense, may conduct reference and background checks on the Vendor's Project Staff. The State shall maintain the confidentiality of reference and background screening results. The State reserves the right to reject the Vendor's Project Staff as a result of such reference and background checks. The State also reserves the right to require removal or reassignment of the Vendor's key Project Staff found unacceptable to the State.

Notwithstanding anything to the contrary, the State shall have the option to terminate the Contract, at its discretion, if it is dissatisfied with the Vendor's replacement Project Staff.

H-25.6 Change Orders

The State may make changes or revisions at any time by written Change Order. Within five (5) business days of a Vendor's receipt of a Change Order, the Vendor shall advise the State, in detail, of any impact on cost (e.g., increase or decrease), the Schedule, or the Work Plan.

A Vendor may request a change within the scope of the Contract by written Change Order, identifying any impact on cost, the Schedule, or the Work Plan. The State shall attempt to respond to a Vendor's requested Change Order within five (5) business days. The State, which includes the requesting Agency and the Department of Information Technology, must approve all change orders in writing. The State shall be deemed to have rejected the Change Order if the parties are unable to reach an agreement in writing.

All Change Order requests from a Vendor to the State, and the State acceptance of a Vendor's estimate for a State requested change, will be acknowledged and responded to, either acceptance or rejection, in writing. If accepted, the Change Order(s) shall be subject to the Contract amendment process, as determined to apply by the State.

H-25.7 Licenses

The State has defined the Software license grant rights, terms and conditions, and has documented the evaluation criteria.

H-25.7.1 Software License Grant

The Software License shall grant the State a worldwide, perpetual, irrevocable, non-exclusive, non-transferable, limited license to use the Software and its associated Documentation, subject to the terms of the Contract.

The State may allow its agents and Vendors to access and use the Software, and in such event, the State shall first obtain written agreement from such agents and Vendors that each shall abide by the terms and conditions set forth herein.

H-25.7.2 Software and Documentation Copies

The Vendor shall provide the State with a sufficient number of hard copy versions of the Software's associated Documentation and one (1) electronic version in Microsoft WORD and PDF format. The State shall have the right to copy the Software and its associated Documentation for its internal business needs. The State agrees to include copyright and proprietary notices provided to the State by the Vendor on such copies.

H-25.7.3 Restrictions

Except as otherwise permitted under the Contract, the State agrees not to:

a. Remove or modify any program markings or any notice of Vendor's proprietary rights;
b. Make the programs or materials available in any manner to any third party for use in the third party's business operations, except as permitted herein; or
c. Cause or permit reverse engineering, disassembly or recompilation of the programs.

H-25.7.4 Title

The Vendor must hold the right to allow the State to use the Software or hold all title, right, and interest (including all ownership and intellectual property rights) in the Software and its associated Documentation.

H-25.7.5 Third Party

The Vendor shall identify all third party contracts to be provided under the Contract with the Vendor's Proposal. The terms in any such contracts must be consistent with this RFP and any resulting Contract, including, but not limited to Appendix H: State of New Hampshire Terms and Conditions General Provisions Form P-37.

H-25.8 Warranty

H-25.8.1 Warranty Period

The Warranty Period will initially commence upon the State issuance of Provisional Final System Acceptance and will continue for one year.

H-25.8.2 Warranties

H-25.8.2.1 System

The Vendor shall warrant that the System must operate to conform to the Specifications, terms, and requirements of the Contract.

H-25.8.2.2 Software

The Vendor shall warrant that the Software is properly functioning within the System, compliant with the requirements of the Contract, and will operate in accordance with the Specifications.

Software shall be archived and or version controlled through the use of software.

H-25.8.2.3 Non-Infringement

The Vendor shall warrant that it has good title to, or the right to allow the State to use all Services, equipment, and Software provided under this Contract, and that such Services, equipment, and Software ("Material") do not violate or infringe any patent, trademark, copyright, trade name or other intellectual property rights or misappropriate a trade secret of any third party.

H-25.8.2.4 Viruses; Destructive Programming

The Vendor shall warrant that the Software will not contain any viruses, destructive programming, or mechanisms designed to disrupt the performance of the Software in accordance with the Specifications.

H-25.8.2.5 Compatibility

The Vendor shall warrant that all System components, including any replacement or upgraded System Software components provided by the Vendor to correct Deficiencies or as an Enhancement, shall operate with the rest of the System without loss of any functionality.

H-25.8.2.6 Professional Services

The Vendor shall warrant that all Services provided under the Contract will be provided in a professional manner in accordance with industry standards and that Services will comply with performance standards.

H-25.8.2.7 Hardware

The Contractor shall warrants that all materials, equipment, labor furnished or performed under the Contract and other hardware items provided by the Contractor or by any of its Subcontractors of any tier for

the Project (i) shall meet the applicable functional requirements of the Contract as detailed in Appendix C: Requirements and Deliverables (ii) shall be new at the time furnished and (iii) shall be free of all liens, encumbrances and other rights and interests of third parties and (iv) shall be free of defects. Contractor, at its option, shall at no charge either repair any warranted product not meeting these requirements with new or reconditioned parts, or replace it with the same or an equivalent product, subject to the Notice provisions set forth herein.

The Contractor shall be responsible for all warranty covered repair work and for identification of failures as set forth in Appendix C: Requirements and Deliverables. Contractor shall provide comprehensive and continuing warranty repair and restoration services on all aspects of the delivered equipment including, but not limited to, hardware and software products during the Warranty Period. Any warranty from a Subcontractor or supplier to Contractor, which exceeds this time period, shall be extended to the Agency for the same period of time as given to Contractor.

Replacement parts and repairs provided pursuant to corrective work hereunder shall be subject to prior Approval by The Agency and shall be tendered and performed in the same manner and extent as items originally delivered. Contractor warrants such redesigned, repaired, or replaced work against defective design, materials, and workmanship for the remainder of the warranty period of the replaced part, or a period of six (6) months from the date of acceptance of the new (or repaired) part by the Agency, whichever occurs later.

H-25.8.3 Warranty Services

The Vendor shall agree to maintain, repair, and correct Deficiencies in the System Software, including but not limited to the individual modules or functions, during the Warranty Period at no additional cost to the State, in accordance with the Specifications and terms and requirements of the Contract, including without limitation, correcting all errors, and Defects and Deficiencies; eliminating viruses or destructive programming; and replacing incorrect, Defective or Deficient Software and Documentation.

Warranty Services shall include, without limitation, the following:

- **a.** Maintain the System Software in accordance with the Specifications, terms, and requirements of the Contract;
- **b.** Repair or replace the System Software or any portion thereof so that the System operates in accordance with the Specifications, terms, and requirements of the Contract;
- **c.** The Vendor shall have available to the State on-call telephone assistance, with issue tracking available to the State, twenty four (24) hours per day and seven (7) days a week with an email / telephone response within two (2) hours of request, with assistance response dependent upon issue severity;
- **d.** On-site additional Services within four (4) business hours of a request;
- **e.** Maintain a record of the activities related to Warranty Repair or maintenance activities performed for the State;
- **f.** For all Warranty Services calls, the Vendor shall ensure the following information will be collected and maintained:
    - **1)** nature of the Deficiency;
    - **2)** current status of the Deficiency;
    - **3)** action plans, dates, and times;
    - **4)** expected and actual completion time;
    - **5)** Deficiency resolution information;
    - **6)** Resolved by;
    - **7)** Identifying number i.e. work order number;
    - **8)** Issue identified by;
- **g.** The Vendor must work with the State to identify and troubleshoot potentially large-scale Software failures or Deficiencies by collecting the following information:
    - **1)** mean time between reported Deficiencies with the Software;
    - **2)** diagnosis of the root cause of the problem; and
    - **3)** identification of repeat calls or repeat Software problems; and
- **h.** All Deficiencies found during the Warranty Period and all Deficiencies found with the Warranty Releases shall be corrected by the Vendor no later than five (5) business days, unless specifically extended in writing by the State, at no additional cost to the State.

If in the Event of Default, the Vendor fails to correct the Deficiency within the allotted period of time (see above), the State shall have the right, at its option: 1) declare the Vendor in default, terminate the Contract, in whole or in part, without penalty or liability to the State; 2) return the Vendor's product and receive a refund for all amounts paid to the Vendor, including but not limited to, applicable license fees within ninety (90) days of notification to the Vendor of the State's intent to request a refund; 3) and to pursue its remedies available at law or in equity.

Notwithstanding any provision of the Contract, the State's option to terminate the Contract and pursue the remedies above will remain in effect until satisfactory completion of the full Warranty Period.

H-25.9 Ongoing Software Maintenance and Support Levels

Vendors shall submit, in their Proposals, copies of their proposed maintenance and support agreement for software maintenance and support Work following the completion of the Warranty Period. That agreement shall not contain any terms or provisions that conflict with this RFP, including but not limited to, the Agency's terms and conditions, licensing or warranty requirements set forth in Appendix H: General Contract Requirements. The Vendor's standard maintenance and support form will not be acceptable. This ongoing support will be included in the optional four (4) year extension of this contract.

All software and firmware furnished under the Contract shall be warranted by both the Contractor and manufacturer(s) to be free of defects in workmanship for a period of four (4) years after the one-year all-inclusive warranty. All software and firmware shall remain in good working order in the sole judgment of NHDOT; and, shall meet or exceed the requirements of the RFP Technical Specifications.

The Vendor will not be responsible for maintenance or support for Software developed or modified by the State.

H-25.9.1 Maintenance Releases

The Vendor shall make available to the State the latest program updates, general maintenance releases, selected functionality releases, patches, and documentation that are generally offered to its customers, at no additional cost.

H-25.9.2 Maintenance and Support Levels

Maintenance support provided by the Contractor shall be set forth is Appendix C: Requirements and Deliverables.

H-25.10 Administrative Specifications

H-25.10.1 Travel Expenses

The State will not be responsible for any travel or out of pocket expenses incurred in the performance of the Services.

The Vendor must assume all travel and related expenses by "fully loading" the proposed labor rates to include, but not limited to: meals, hotel/housing, airfare, car rentals, car mileage, and out of pocket expenses.

H-25.10.2 Shipping and Delivery Fee Exemption

The State will not pay for any shipping or delivery fees unless specifically itemized in the Contract.

H-25.10.3 Access/Cooperation

As applicable, and reasonably necessary, and subject to the applicable State and federal laws and regulations and restrictions imposed by third parties upon the State, the State will provide the Vendor with access to all program files, libraries, personal computer-based systems, software packages, network systems, security systems, and hardware as required to complete the contracted Services.

The State will use reasonable efforts to provide approvals, authorizations, and decisions reasonably necessary to allow the Vendor to perform its obligations under the Contract.

H-25.10.4 State-Owned Documents and Data

The Vendor shall provide the State access to all Documents, State Data, materials, reports, and other work in progress relating to the Contract ("State Owned Documents"). Upon expiration or termination of the Contract with the State, Vendor shall turn over all State-owned Documents, State Data, material, reports, and work in progress relating to this Contract to the State at no additional cost to the State. State-Owned Documents must be provided in both printed and electronic format.

H-25.10.5 Intellectual Property

For all Software, pre-existing and developed, the Contractor shall provide a perpetual license back to the State that allows for the Bureau and DoIT use of the software and right to the Source Code. The Bureau and DoIT may maintain and/or modify the source code for the Agency's use but agrees not to sell or provide the source code to others at the conclusion of the maintenance contract or at a point to be determined by the Agency. Vendor shall clarify any concerns with these terms in response to Question #16 in Appendix D.

In no event shall the Vendor be precluded from developing for itself, or for others, materials that are competitive with, or similar to custom software, modifications developed in connection with performance of obligations under the Contract. In addition, the Vendor shall be free to use its general knowledge, skills, experience, and any other ideas, concepts, know-how, and techniques that are acquired or used in the course of its performance under this agreement.

All 3rd Party software required to operate and maintain the system shall be registered in the name of the Agency.

H-25.10.6 DoIT Required Work Procedures

All work done must conform to standards and procedures established by the Department of Information Technology and the State.

H-25.10.7 Computer Use

In consideration for receiving access to and use of the computer facilities, network, licensed or developed software, software maintained or operated by any of the State entities, systems, equipment, Documentation, information, reports, or data of any kind (hereinafter "Information"), Vendor understands and agrees to the following rules:

a. Every Authorized User has the responsibility to assure the protection of information from unauthorized access, misuse, theft, damage, destruction, modification, or disclosure.

b. That information shall be used solely for conducting official State business, and all other use or access is strictly forbidden including, but not limited to, personal, or other private and non-State use and that at no time shall Vendor access or attempt to access any information without having the express authority to do so.

c. That at no time shall Vendor access or attempt to access any information in a manner inconsistent with the approved policies, procedures, and /or agreements relating to system entry/access.

d. That all software licensed, developed, or being evaluated by the State cannot be copied, shared, distributed, sub-licensed, modified, reverse engineered, rented, or sold, and that at all times Vendor must use utmost care to protect and keep such software strictly confidential in accordance with the license or any other Agreement executed by the State. Only equipment or software owned, licensed, or being evaluated by the State, can be used by the Vendor. Personal software (including but not limited to palmtop sync software) shall not be installed on any equipment.

e. That if the Vendor is found to be in violation of any of the above-stated rules, the User may face removal from the State Contract, and/or criminal or civil prosecution, if the act constitutes a violation of law.

H-25.10.8 Email Use

Mail and other electronic communication messaging systems are State of New Hampshire property and are to be used for business purposes only. Email is defined as "internal email systems" or "State-funded email systems." Vendors understand and agree that use of email shall follow State standard policy (available upon request).

H-25-10.9 Internet/Intranet Use

The Internet/Intranet is to be used for access to and distribution of information in direct support of the business of the State of New Hampshire according to State standard policy (available upon request).

H-25.10.10 Regulatory/Governmental Approvals

Any Contract awarded under the RFP shall be contingent upon the Vendor obtaining all necessary and applicable regulatory or other governmental approvals.

H-25.10.11 Force Majeure

Neither Vendor nor the State shall be responsible for delays or failures in performance resulting from events beyond the control of such party and without fault or negligence of such party. Such events shall include, but not be limited to, acts of God, strikes, lock outs, riots, and acts of War, epidemics, acts of Government, fire, power failures, nuclear accidents, earthquakes, and unusually severe weather.

Except in the event of the foregoing, Force Majeure events shall not include Vendor's inability to hire or provide personnel needed for the Vendor's performance under the Contract.

H-25.10.12 Confidential Information

In performing its obligations under the Contract, the Contractor may gain access to information of the State, including Confidential Information. The Contractor shall not use information developed or obtained during the performance of, or acquired, or developed by reason of the Contract, except as is directly connected to and necessary for the Contractor's performance under the Contract.

The Contractor agrees to maintain the confidentiality of and to protect from unauthorized use, disclosure, publication, and reproduction, all information of the State that becomes available to the Contractor in connection with its performance under the Contract, regardless of its form. Subject to applicable federal or State laws and regulations, Confidential Information shall not include information which: (i) shall have otherwise become publicly available other than as a result of disclosure by the receiving party in breach hereof; (ii) was disclosed to the receiving party on a non-confidential basis from a source other than the disclosing party, which the receiving party believes is not prohibited from disclosing such information as a result of an obligation in favor of the disclosing party; (iii) is developed by the receiving party independently of, or was known by the receiving party prior to, any disclosure of such information made by the disclosing party; or (iv) is

disclosed with the written consent of the disclosing party. A receiving party also may disclose Confidential Information to the extent required by an order of a court of competent jurisdiction.

Any disclosure of the State's information shall require prior written Approval of the State. The Contractor shall immediately notify the State if any request, subpoena or other legal process is served upon the Contractor regarding the State's information, and the Contractor shall cooperate with the State in any effort it undertakes to contest the subpoena or other legal process.

In the event of unauthorized use or disclosure of the State's information, the Contractor shall immediately notify the State, and the State shall immediately be entitled to pursue any remedy at law, including, but not limited to injunctive relief.

Insofar as the Contractor seeks to maintain the confidentiality of its confidential or proprietary information, the Contractor must clearly identify in writing the information it claims to be confidential or proprietary, as further set forth in Section 4.8 of this RFP. The Contractor acknowledges that the State is subject to the Right to Know law, RSA Chapter 91-A. The State shall maintain the confidentiality of the identified Confidential Information insofar as it is consistent with applicable laws or regulations, including but not limited to, RSA Chapter 91-A. In the event the State receives a request for the information identified by the Contractor as confidential, the State shall notify the Contractor and specify the date the State will be releasing the requested information. Any effort to prohibit or enjoin the release of the information shall be the Contractor's sole responsibility and at the Contractor's sole expense. If the Contractor fails to obtain a court order enjoining the disclosure, the State shall release the information on the date specified in the State's notice to the Contractor without any State liability to the Contractor.

This Section shall survive termination or Contract Conclusion.

H-25.10.13 Contractor's Relation to the State

In the performance of the Contract, the Contractor is in all respects an independent Contractor, and is neither an agent nor an employee of the State. Neither the Contractor nor any of its officers, employees, agents, or members shall have authority to bind the State or receive any benefits, worker's compensation or other emoluments provided by the State to its employees.

H-25.10.14 Indemnification

The Contractor shall defend, indemnify, and hold harmless the State, its officers and employees, from and against any and all losses suffered by the State, its officers and employees, and any and all claims, liabilities or penalties asserted against the State, its officers and employees, by or on behalf of any person, on account of, based or resulting from, arising out of

(or which may be claimed to arise out of) the acts or omissions of the Contractor, its personnel or agents during the course of performance of the Work hereunder.

Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is hereby reserved to the State.

This Section H-25.10.18: *Indemnification* shall survive termination or conclusion of the Contract.

H-25.10.15 Insurance

The Contractor shall, at its sole expense, obtain and maintain in force, and shall require any Subcontractor or assignee to obtain and maintain in force, the insurance as set forth in New Hampshire DOT Standard Specification for Road and Bridge Construction, Section 107.11 *Responsibility for Damage Claims*.

Additional insurance required for this Project include:

Pollution/Environmental Impairment Liability Coverage

Insurance for this coverage shall meet the New Hampshire DOT Standard Specification under Section 107.17 *Hazardous Materials*.

Professional Liability Coverage:

Professional Liability Insurance in the amount of $1,000,000 shall be obtained by the Contractor and any design professionals retained by Contractor for the Project.

Inland Marine:

All tools and equipment that the Covered Party has at the job Site or is owned by the Covered Party are the responsibility of the Covered Party, respectively. The Agency assumes no responsibility for the protection, maintenance, or repair of any tools or equipment.

All materials required by the Contract that can be damaged, stolen, or lost, must be insured by the Covered Party as any partial payments made to the Covered Party are deemed to be payment for such materials.

Proof of coverage for applicable limits shall be provided on the Certificate of Insurance. The transportation risk must be included.

Deductibles or Self Insured Retentions:

All deductibles and self insured retentions are the sole responsibility of the Covered Party. Deductibles or Self-Insured Retentions must be shown on the Certificate of Insurance. No retention (deductible) shall be more than $75,000.

H-25.10.15.2 Standard Policy Forms

The policies shall be the standard policy forms and endorsements approved for use in the State of New Hampshire by the New Hampshire Department of Insurance, and issued by insurers licensed in the State of New Hampshire or underwriters acceptable to the State, and authorized to do business in the State of New Hampshire. Each certificate of insurance shall contain a clause prohibiting cancellation or modifications of the policy earlier than ten (10) days after written notice thereof has been received by the State.

H-25.10.15.3 Insurance Certificates

The Contractor shall furnish to the Insurance Certificate Holder the certificate(s) of insurance for all insurance required under the Contract. The Contractor shall also furnish to the Insurance Certificate Holder certificate(s) of insurance for all renewal(s) of insurance required under the Contract no later than fifteen (15) days prior to the expiration date of each of the insurance policies. The certificate(s) of insurance and any renewals thereof shall be attached to the Contract and are incorporated therein by reference.

The ACORD Insurance Certificate should note the Certificate Holder in the lower left hand block including State of New Hampshire, Department Name, name of the individual responsible for the funding of the contracts and his/her address.

Department of Transportation, Bureau of Turnpikes funded projects the Certificate Holder and address should be identified as:

State of New Hampshire
Department of Transportation
Attn: Christopher Waszczuk
36 Hackett Hill Road, Hooksett, NH 03106.

H-25.10.15.4 Waiver of Rights of Recovery and Waiver of Rights of Subrogation

a) The Certificate of Insurance must evidence a Waiver of Recovery and Waiver of Subrogation in favor of the Agency and all Additional Insureds where applicable on all policies including Workers' Compensation and Employers Liability.

b) The Covered Party waives all rights of recovery against the Agency and all the additional insureds for loss or damage covered by any of the insurance maintained by the Covered Party pursuant to this Contract.

c) The Covered Party hereby waives, and shall cause its insurance carriers to waive, all rights of subrogation against the Agency and all the additional insureds for loss or damage covered by any of the insurance maintained by the Covered Party pursuant to this Contract.

d) If any of the policies of insurance required under this Contract require an endorsement to provide for the waiver of subrogation set forth in c, above, then the named insureds of such policies will cause them to be so endorsed.

H-25.10.15.5 Claims Made Policy Forms:

Should any of the required liability coverages be on a "Claims Made" Basis, coverage must be available for the duration of the Contract and for a minimum of three (3) years following the completion of the Contract.

H-25.10.15.6 Review of Insurance Requirements by the Covered Party's Insurance Representative:

a) The Covered Party warrants that this Contract has been thoroughly reviewed by the Covered Party's insurance agent(s)/broker(s), who have been instructed by the Covered Party to procure the insurance coverage required by this Contract.

b) The amount of insurance provided in the aforementioned insurance coverages, shall not be construed to be a limitation of the liability on the part of the Covered Party.

c) Any type of insurance or any increase in limits of liability not described above which the Covered Party requires for its own protection or on account of statute shall be its own responsibility and at its own expense.

d) The carrying of insurance described herein shall in no way be interpreted as relieving the Covered Party of any responsibility or liability under the Contract.

e) In the event of a failure of the Covered Party to furnish and maintain said insurance and to furnish satisfactory evidence thereof, the Agency shall have the right (but not the obligation) to take out and maintain the same for all parties on behalf of the Covered Party who agrees to furnish all necessary information thereof and to pay the cost thereof immediately upon presentation of an invoice.

In no event shall the Contractor or any Consultant begin Work until Certificates of Insurance showing coverage in the aforementioned amounts required for the Contract is received and approved by the Agency. Any Work performed without having the Certificates of Insurance received and approved by the Agency is at the Contractor and Consultant's own and sole risk

H-25.10.15.6 Licensed Sureties and Insurers; Certificates of Insurance

The following shall be required in addition to the requirements in New Hampshire DOT Standard Specification Section 107.11 related to this topic:

Contractor shall deliver to Agency, with copies to each additional insured indicated in the Contract Documents, certificates of insurance (and other evidence of insurance requested by Agency or any other additional insured) which Contractor is required to purchase and

maintain in accordance with the requirements stated within this RFP and referenced documents.

H-25.10.16 Workers' Compensation

H-25.10.16.1

By signing the Contract the Contractor Contractor agrees, certifies and warrants that the Contractor is in compliance with or exempt from, the requirements of N.H. RSA chapter 281-A *("Workers' Compensation")*.

H-25.10.16.2

To the extent the Contractor is subject to the requirements of N.H. RSA chapter 281-A, the Contractor shall maintain, and require any Subcontractor or assignee to secure and maintain, payment of Workers' Compensation in connection with activities which the person proposes to undertake pursuant to this Agreement. The Contractor shall furnish the Insurance Certificate Holder, or his or her successor, proof of Workers' Compensation in the manner described in N.H. RSA chapter 281-A and any applicable renewal(s) thereof, which shall be attached to the Contract and shall be incorporated therein by reference.

H-25.10.16.3

The State shall not be responsible for payment of any Workers' Compensation premiums or for any other claim or benefit for the Contractor, or any Subcontractor or employee of the Contractor, which might arise under applicable State of New Hampshire Workers' Compensation laws in connection with the performance of the Work under the Contract.

H-25.10.17 Waiver of Event of Default

No failure by the State to enforce any provisions hereof after any Event of Default shall be deemed a waiver of its rights with regard to that Event of Default, or any subsequent Event of Default. No express failure to enforce any Event of Default shall be deemed a waiver of the right of the State to enforce each and all of the provisions hereof upon any further or other Event of Default on the part of the Contractor.

H-25.10.18 Notice

Any notice by a party to the other party shall be deemed to have been duly delivered or given at the time of mailing by certified mail, postage prepaid, in a United States Post Office addressed to the parties at the following addresses.

TO CONTRACTOR:	TO STATE:
[Name]	State of New Hampshire
[Address]	Department of Transportation
[City, State] [Zip]	Bureau of Turnpikes,
[Telephone Number]	36 Hackett Hill Road
	Hooksett, NH 03106
	(603) 485-3806

H-25.10.19 Amendment

The Contract may be amended, waived, or discharged only by an instrument in writing signed by the parties hereto and only after approval of such amendment, waiver, or discharge by the Governor and Executive Council of the State of New Hampshire.

H-25.10.20 Construction of Contract and Terms

The Contract shall be construed in accordance with the laws of the State of New Hampshire, and is binding upon and inures to the benefit of the parties and their respective successors and assigns. The wording used in the Contract is the wording chosen by the parties to express their mutual intent, and no rule of construction shall be applied against or in favor of any party.

H-25.10.21 Third Parties

The parties hereto do not intend to benefit any third parties and the Contract shall not be construed to confer any such benefit.

H-25.10.22 Headings

The headings throughout the Contract are for reference purposes only, and the words contained therein shall in no way be held to explain, modify, amplify, or aid in the interpretation, construction, or meaning of the provisions of the Contract.

H-25.10.23 Exhibits

The Exhibits referred to in and attached to the Contract are made a part of it as if fully included in the text.

H-25.10.24 Special Provisions

See *Appendix C: Requirements and Deliverables* for specific requirements.

H-25.10.25 Severability

In the event of any of the provisions of the Contract are held by a court of competent jurisdiction to be contrary to any state or federal law, the remaining provisions of the Contract will remain in full force and effect.

H-25.10.26 Venue and Justification

Any action on the Contract may only be bought in the State of New Hampshire Merrimack County Superior Court.

H-25.10.27 Survival

The terms, conditions and warranties contained in the Contract that by their context are intended to survive the completion of the performance, cancellation or termination of the Contract shall so survive.

H-25.10.28 Entire Agreement

The Contract, which may be executed in a number of counterparts, each of which shall be deemed an original, constitutes the entire Contract and understanding between the parties, and supersedes all prior Contracts and understandings pertaining to the Project.

H-25.11 Pricing

H-25.11.1 Activities/Deliverables/Milestones Dates and Pricing

Deliverables dates and pricing schedules are provided in Appendix C.

H-25.11.2 Software Licensing, Maintenance, Enhancements, and Support Pricing

The Vendor must provide the minimum Software support and Services through Software licensing, maintenance, Enhancements, and support as detailed in Section H-25.11: Ongoing Software Maintenance and Support Levels.

For Software licensing, maintenance, and support costs, complete a worksheet including all costs in the table. A worksheet is provided in Appendix I: Pricing Worksheets.

H-25.11.3 Invoicing

The Vendor shall submit correct invoices to the State for all amounts to be paid by the State. All invoices submitted shall be subject to the State's written approval, which shall not be unreasonably withheld. The Vendor shall only submit invoices for Services or Deliverables as permitted by the Contract. Invoices must be in a format as determined by the State and contain detailed information, including without limitation: itemization of each Deliverable and identification of the Deliverable for which payment is sought, and the Acceptance date triggering such payment; date of delivery and/or installation; monthly maintenance charges; any other Project costs or retention amounts if applicable.

H-25.11.4 Overpayments to the Vendor

The Vendor shall promptly, but no later than fifteen (15) business days, pay the State the full amount of any overpayment or erroneous payment upon discovery or notice from the State.

H-25.11.5 Credits

The State may apply credits due to the State, arising out of this Contract, against the Vendor's invoices with appropriate information attached.

H-25.11.6 Records Retention and Access Requirements

The Vendor shall agree to the conditions of all applicable State and federal laws and regulations, which are incorporated herein by this reference, regarding retention and access requirements, including without limitation, retention policies consistent with the Federal Acquisition Regulations (FAR) Subpart 4.7 Vendor Records Retention.

The Vendor and its Subcontractors shall maintain books, records, documents, and other evidence of accounting procedures and practices, which properly and sufficiently reflect all direct and indirect costs, invoiced in the performance of their respective obligations under the Contract. The Vendor

and its Subcontractors shall retain all such records for three (3) years following termination of the Contract, including any extensions. Records relating to any litigation matters regarding the Contract shall be kept for one (1) year following the termination of all litigation, including the termination of all appeals or the expiration of the appeals period.

Upon prior notice and subject to reasonable time frames, all such records shall be subject to inspection, examination, audit and copying by personnel so authorized by the State and federal officials so authorized by law, rule, regulation or Contract, as applicable. Access to these items will be provided within Merrimack County of the State of New Hampshire, unless otherwise agreed by the State. Delivery of and access to such records shall be at no cost to the State during the three (3) year period following termination of the Contract and one (1) year term following litigation relating to the Contract, including all appeals or the expiration of the appeal period. The Vendor shall include the record retention and review requirements of this section in any of its subcontracts.

The State agrees that books, records, documents, and other evidence of accounting procedures and practices related to the Vendor's cost structure and profit factors shall be excluded from the State's review unless the cost or any other Services or Deliverables provided under the Contract is calculated or derived from the cost structure or profit factors.

H-25.11.7 Accounting Requirements

The Vendor shall maintain an accounting system in accordance with generally accepted accounting principles (GAAP). The costs applicable to the Contract shall be ascertainable from the accounting system and the Vendor shall maintain records pertaining to the Services and all other costs and expenditures.

H-25.11.8 Contract Security/Performance Bond

The Contractor shall furnish the Agency with a Performance Bond in an amount equal to 100% of the total value of the Implementation within ten (10) business days of receipt of notice of intent to award a contract. The Contractor shall bear the full expense of both the initial expense and the annual premiums for the Performance Bond. If such is not provided, the award may be nullified.

The Performance Bond shall be in a form and substance satisfactory to the Agency. The Performance Bond shall be maintained by the Contractor in full force and effect until Final Project Acceptance. The Contractor or any of its sureties shall not be released from their obligations under the Performance Bond from any change or extension of time, or termination of this Contract. The Performance Bond shall contain a waiver of notice of

any changes to this Contract or the Deliverables or the Specifications, or of any Change Orders.

A licensed insurance company authorized to do business in the State of New Hampshire shall issue the Performance Bond made payable to the State of New Hampshire. The Performance Bond shall contain the Contract number and dates of performance. The Contractor shall extend the validity and enforcement of the Performance Bond for said periods if the Agency exercises an option to extend the Contract for any additional period(s).

The Performance Bond shall secure the performance of the Contractor, including without limitation performance of the Work in accordance with the Project Plan and providing Deliverables in accordance with the Specifications, and shall secure any damages, cost or expenses resulting from the Contractor's default in performance or liability caused by the Contractor. The Performance Bond shall become payable to the State for any outstanding damage assessments made by the State against the Contractor if there is a termination for default. An amount up to the full amounts of the Performance Bond may also be applied to the Contractor's liability for any administrative costs and/or excess costs incurred by the Agency in obtaining similar software, deliverables, other products, and Work to replace those terminated as a result of the Contractor's default. In addition to this stated liability, the Agency may seek other remedies.

The Agency reserves the right to review the Performance Bond and to require the Contractor to substitute a more acceptable Performance Bond in such form(s) as the Agency deems necessary prior to acceptance of the Performance Bond.

H-25.12 Termination

This section H-25.12 shall survive termination or Contract conclusion.

H-25.12.1 Termination for Default

Any one or more of the following acts or omissions of the Vendor shall constitute an event of default hereunder ("Event of Default")
a. Failure to perform the Services satisfactorily or on schedule;
b. Failure to submit any report required; and/or
c. to perform any other covenant, term or condition of the Contract

Upon the occurrence of any Event of Default, the State may take any one or more, or all, of the following actions:

a) Unless otherwise provided in the Contract, the State shall provide the Vendor written notice of default and require it to be remedied within, in the absence of a greater or lesser specification of time, within thirty (30) days from the date of notice, unless otherwise indicated within by the State ("Cure Period"). If the Vendor fails to cure the default within the Cure Period, the State may terminate the Contract effective two (2) days after giving the Vendor notice of termination, at its sole discretion, treat the Contract as breached and pursue its remedies at law or in equity or both.

b) Give the Vendor a written notice specifying the Event of Default and suspending all payments to be made under the Contract and ordering that the portion of the Contract price which would otherwise accrue to the Vendor during the period from the date of such notice until such time as the State determines that the Vendor has cured the Event of Default shall never be paid to the Vendor.

c) Set off against any other obligations the State may owe to the Vendor any damages the State suffers by reason of any Event of Default;

d) Treat the Contract as breached and pursue any of its remedies at law or in equity, or both.

e) Procure Services that are the subject of the Contract from another source and the Vendor shall be liable for reimbursing the State for the replacement Services, and all administrative costs directly related to the replacement of the Contract and procuring the Services from another

source, such as costs of competitive bidding, mailing, advertising, applicable fees, charges or penalties, and staff time costs; all of which shall be subject to the limitations of liability set forth in the Contract.

In the event of default by the State, the Vendor shall provide the State with written notice of default, and the State shall cure the default within thirty (30) days.

Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is herby reserved to the State. This covenant shall survive termination or Contract Conclusion.

H-25.12.2 Termination for Convenience

The State may, at its sole discretion, terminate the Contract for convenience, in whole or in part, by thirty (30) days written notice to the Vendor. In the event of such termination for convenience, the State shall pay the Vendor the agreed upon price, if separately stated, for Deliverables for which Acceptance has been given by the State. Amounts for Services or Deliverables provided prior to the date of termination for which no separate price is stated will be paid, in whole or in part, generally in accordance with Appendix F: Pricing Worksheet Instructions.

During the thirty (30) day period, the Vendor shall wind down and cease its Services as quickly and efficiently as reasonably possible, without performing unnecessary Services or activities and by minimizing negative effects on the State from such winding down and cessation of Services.

H-25.12.3 Termination for Conflict of Interest

The State may terminate the Contract by written notice if it determines that a conflict of interest exists, including but not limited to, a violation by any of the parties hereto of applicable laws regarding ethics in public acquisitions and procurement and performance of Contracts.

In such case, the State shall be entitled to a pro-rated refund of any current development, support and maintenance costs. The State shall pay all other contracted payments that would have become due and payable if the Vendor did not know, or reasonably did not know, of the conflict of interest.

In the event the Contract is terminated as provided above pursuant to a violation by the Vendor, the State shall be entitled to pursue the same remedies against the Vendor as it could pursue in the event of a default of the Contract by the Vendor.

H-25.12.4 Termination Procedure

Upon termination of the Contract, the State, in addition to any other rights provided in the Contract, may require the Vendor to deliver to the State any property, including without limitation, Software and Written Deliverables, for such part of the Contract as has been terminated.

After receipt of a notice of termination, and except as otherwise directed by the State, Vendor shall:

a. Stop work under the Contract on the date, and to the extent specified, in the notice;

b. Promptly, but in no event longer than thirty (30) days after termination, terminate its orders and subcontracts related to the work which has been terminated and settle all outstanding liabilities and all claims arising out of such termination of orders and subcontracts, with the approval or ratification of the State to the extent required, which approval or ratification shall be final for the purpose of this Section;

c. Take such action as the State directs, or as necessary to preserve and protect the property related to the Contract which is in the possession of Vendor and in which State has an interest;

d. Transfer title to the State and deliver in the manner, at the times, and to the extent directed by the State, any property which is required to be furnished to State and which has been accepted or requested by the State; and

e. Provide written certification to the State that Vendor has surrendered to the State all said property.

H-25.13 Limitation of Liability

H-25.13.1 State

Subject to applicable laws and regulations, in no event shall the State be liable for any consequential, special, indirect, incidental, punitive, or exemplary damages. Subject to applicable laws and regulations, the State's liability to the Vendor shall not exceed the total Contract price set forth in Contract Agreement, Appendix H Section 1.8 of the Contract Agreement – General Provisions.

Notwithstanding the foregoing and any provision of this Contract to the contrary, in no event does the State waive its sovereign immunity or any applicable defenses or immunities.

H-25.13.2 The Vendor

Subject to applicable laws and regulations, in no event shall the Vendor be liable for any consequential, special, indirect, incidental, punitive or exemplary damages and the Vendor's liability to the State shall not exceed two times (2X) the total Contract price set forth in the Contract Agreement, Appendix H Section 1.8 of the Contract Agreement – General Provisions. Notwithstanding the foregoing, the limitation of liability shall not apply to the Vendor's indemnification obligations set forth in the Appendix H Contract Agreement - Sections 13: Indemnification and confidentiality obligations in Appendix H 25.12.14: Confidential Information, which shall be unlimited.

H-25.13.3 State's Immunity

Notwithstanding the foregoing, nothing herein contained shall be deemed to constitute a waiver of the sovereign immunity of the State, which immunity is hereby reserved to the State. This covenant shall survive termination or Contract conclusion.

H.25.13.4 Survival

This Contract Agreement, Section H-25.13: Limitation of Liability shall survive termination or Contract conclusion.

H-25.14 Change of Ownership

In the event that the Vendor should change ownership for any reason whatsoever, the State shall have the option of continuing under the Contract with the Vendor, its successors or assigns for the full remaining term of the Contract; continuing under the Contract with the Vendor, its successors or assigns for such period of time as determined necessary by the State; or immediately terminate the Contract without liability to the Vendor, its successors or assigns.

H-25.15 Assignment, Delegation and Subcontracts

The Vendor shall not assign, delegate, subcontract, or otherwise transfer any of its interest, rights, or duties under the Contract without the prior written consent of the State. Such consent will not be unreasonably withheld. Any attempted transfer, assignment, delegation, or other transfer made without the State's prior written consent shall be null and void and may constitute an event of default at the sole discretion of the State.

The Vendor shall remain wholly responsible for performance of the entire Contract regardless of whether assignees, delegates, Subcontractors or other transferees ("Assigns") are used, unless otherwise agreed to in writing by the State and the Assigns fully assumes in writing any and all obligations and liabilities under the Contract from the Effective Date . In the absence of a written assumption of full obligations and liabilities of the Contract, any permitted assignment, delegation, subcontract or other transfer shall neither relieve the Vendor of any of its obligations

under the Contract nor shall it affect any remedies available to the State against the Vendor that may arise from any event of default of the provisions of the Contract. The State will consider the Vendor to be the sole point of contact with regard to all contractual matters, including payment of any and all charges resulting from the Contract.

H-25.16 Dispute Resolution

Prior to the filing of any formal proceedings with respect to a dispute (other than an action seeking injunctive relief with respect to intellectual property rights or Confidential Information), the party believing itself aggrieved (the "Invoking Party") shall call for progressive management involvement in the dispute negotiation by written notice to the other party. Such notice shall be without prejudice to the Invoking Party's right to any other remedy permitted by this Agreement.

H-25.17 Venue and Jurisdiction

Any action on the Contract may only be brought in the State of New Hampshire Merrimack County Superior Court.

H-25.18 Project Holdback

The State will withhold 5% of the agreed Deliverables pricing tendered by the Vendor in this firm and fixed price engagement until final project acceptance.

H-25.19 Escrow of Code

Vendor will enter into a source and configuration code escrow agreement, with a State approved escrow agent. The proposed escrow agreement shall be submitted with the Vendor's Proposal for review by the State. The escrow agreement requires the Vendor to put the Vendor Software source and configuration code in escrow. The source code shall be released to the State if one of the following events has occurred:

a. the Vendor has made an assignment for the benefit of creditors;
b. the Vendor institutes or becomes subject to a liquidation or bankruptcy proceeding of any kind;
c. a receiver or similar officer has been appointed to take charge of all or part of the Vendor's assets; or
d. the Vendor or its Subcontractor terminates its maintenance and operations support Services for the State for the Software or has ceased supporting and maintaining the Software for the State, whether due to its ceasing to conduct business generally or otherwise, except in cases where the termination or cessation is a result of the non-payment or other fault of the State;
e. Vendor defaults under the Contract; or
g. Vendor ceases its on-going business operations or that portion of its business operations relating to the licensing and maintenance of the Software.

 Vendor Initials_____

Date_____

TERMS AND DEFINITIONS

The following general contracting terms and definitions apply except as specifically noted elsewhere in this document.

Acceptance	Notice from the State that a Deliverable has satisfied Acceptance Test or Review.
Acceptance Letter	An Acceptance Letter provides notice from the State that a Deliverable has satisfied Acceptance Tests or Review.
Acceptance Period	The timeframe during which the Acceptance Test is performed
Acceptance Test Plan	The Acceptance Test Plan provided by the Vendor and agreed to by the State that describes at a minimum, the specific Acceptance process, criteria, and Schedule for Deliverables.
Access Control	Supports the management of permissions for logging onto a computer or network
Agency	"Agency" shall mean the Bureau or Department, both as defined herein.
Agency Representative	In the context of Appendix C: Requirements and Deliverables, the Bureau's designated representative. Also referred to as "Agency's Designated Representative".
Agreement	A contract duly executed and legally binding.
Apparent Violation	Transactions created in the lane at the time of vehicle passage through the lane where a valid Transponder read was not obtained from the vehicle.
Appendix	Supplementary material that is collected and appended at the back of a document
Approve	"Approve" and its variations (e.g., "Approval") when capitalized in this Contract refer to the Agency's Acceptance of a Document, condition, action or Deliverable in writing for its own internal purposes. The Agency's Approval shall not be construed to mean the State's endorsement or assumption of liability, nor shall it relieve the Contractor of its responsibilities under the Contract.
As-Built Drawings	Documents and other items set forth in *Appendix C:*

	Requirements and Deliverables, that constitute a complete and accurate record of the System as designed, delivered, installed Approved and Accepted.
Audit Trail Capture and Analysis	Supports the identification and monitoring of activities within an application or system
Automatic Clearing House (ACH)	A highly reliable and efficient nationwide batch-oriented electronic funds transfer system governed by the NACHA OPERATING RULES which provide for the inter-bank clearing of electronic payments for participating depository financial institutions.
Automatic Vehicle Detection System (AVDC)	A system for automatic vehicle detection, separation, and classification of vehicles.
Automatic Vehicle Identification (AVI)	A system consisting of RF antenna(s) and reader equipment installed in a toll lane, that meets E-ZPass and IAG requirements, and a compatible transponder mounted on a vehicle for automatic identification of the Transponder account as it passes through the lane.
Breach or Breach of Security	Unlawful and unauthorized acquisition of unencrypted computerized data that materially compromises the security, confidentiality or integrity of personal information maintained by a person or commercial entity
Buffered Transponder Read	Transponder reads that are retained in the AVI reader when communications between the reader and the toll lane controller are down. These reads are not transmitted to the toll lane controller at the time of the Transponder read. Upon reestablishing communications such Transponder reads are transmitted to the toll lane controller and are called Buffered Transponder Reads.
Bureau	New Hampshire Department of Transportation (NHDOT), Bureau of Turnpikes, 36 Hackett Hill Road, Hooksett, NH 03106
Business Day	The 24-hour toll collection day expressed from 00:00 AM to 24:00 AM in military time.
Business Rules	A set of rules proposed by the Contractor and Approved by the Agency that defines how the Toll Collection System shall respond to various situations that occur during the toll collection process, based on business case and policy

	decisions made by the Agency, as the same may be amended from time to time by written agreement of the Agency and the Contractor.
CCP	Change Control Procedures
CR	Change Request
CM	Configuration Management
Certification	The Vendor's written declaration with full supporting and written Documentation (including without limitation test results as applicable) that the Vendor has completed development of the Deliverable and certified its readiness for applicable Acceptance Testing or Review.
Change Control	Formal process for initiating changes to the proposed solution or process once development has begun.
Change Order or Change Request	Formal documentation prepared for a proposed change in the Specifications.
Commissioning	The test that occurs upon completion and Approval of installation that indicates readiness for operations. Live operations shall not occur without the Approval of Commissioning. Upon such Approval, the Project shall be considered Commissioned.
Completion Date	End date for the Contract
Confidential Information	Information required to be kept Confidential from unauthorized disclosure under the Contract
Contract	This Agreement between the State of New Hampshire and a Vendor, which creates binding obligations for each party to perform as specified in the Contract Documents.
Contract Conclusion	Refers to the conclusion of the Contract, for any reason, including but not limited to, the successful Contract completion, termination for convenience, or termination for default.
Contract Documents	Documents that comprise this Contract
Contract Managers	The persons identified by the State and the Vendor who shall be responsible for all contractual authorization and administration of the Contract. These responsibilities shall include but not be limited to processing Contract Documentation, obtaining executive approvals, tracking costs and payments, and representing the parties in all Contract administrative activities.
Contracted Vendor	The vendor whose proposal or quote was awarded the Contract with the State and who is responsible for the Services and Deliverables of the Contract.
Contractor	The contracted Vendor who shall perform the duties and

	specifications of the Contract.
Conversion Test	A test to ensure that a data conversion process correctly takes data from a legacy system and successfully converts it to form that can be used by the new system.
COTS	Commercial off the Shelf
Custom Code	Code developed by the Vendor specifically for this project for the State of New Hampshire
Custom Software	Software developed by the Vendor specifically for this project for the State of New Hampshire
Customized Hardware	The toll collection hardware provided by the System Integrator for the Toll Collection System that is designed and certified by the System Integrator.
Data	State's records, files, forms, Data and other documents or information, in either electronic or paper form, that will be used /converted by the Vendor during the Contract Term
DBA	Database Administrator
Deliverable	A Deliverable is any Written, Software, or Non-Software Deliverable (letter, report, manual, book, other), provided by the Vendor to the State or under the terms of a Contract requirement.
Department	An agency of the State – N.H. Department of Transportation
Department of Information Technology (DoIT)	The Department of Information Technology established under RSA 21-R by the Legislature effective September 5, 2008.
Design Documentation	System Design Documentation required under this Contract, including as example but not limited to: the Requirements Document, Business Rules Document, Software Development Plan, System Requirements Document and System Detailed Design Document.
Developer/Operator	The contracted individual, firm, or company that will perform the duties and Specifications of the contract. (See Vendor)
Digital Video Audit System (DVAS)	System with cameras located at a tolling location that permits remote viewing of vehicular events and images in real time or stored for review. System provides transaction event data overlaid on video for correlation of vehicle and transaction data as defined in this document.
Documentation	All information that describes the installation, operation, and use of the Software, either in printed or electronic format.

Digital Signature	Guarantees the unaltered state of a file
Effective Date	The Contract and all obligations of the parties hereunder shall become effective on the date the Governor and the Executive Council of the State of New Hampshire approves the Contract.
Electronic Toll Collection (ETC)	A system of integrated devices and components that permit the automatic recording of vehicle transactions through electronic media in a toll revenue collection system.
Encryption	Supports the encoding of data for security purposes
EOM	End of Month
Enhancements	Updates, additions, modifications to, and new releases for the Software, and all changes to the Documentation as a result of Enhancements, including, but not limited to, Enhancements produced by Change Orders
Existing Central Host	Shall mean the existing Bureau of Turnpikes toll host server system. Also referred to as "Existing Host" or "Existing Central Host System".
Existing System Integrator	Shall mean the existing Bureau of Turnpikes toll system integrator, currently TRMI. Also referred to as the Existing Toll System Contractor.
Event of Default	Any one or more of the following acts or omissions of a Vendor shall constitute an event of default hereunder ("Event of Default") **a**. Failure to perform the Services satisfactorily or on schedule; **b**. Failure to submit any report required; and/or **c**. Failure to perform any other covenant, term or condition of the Contract
Extended Operations Test	A ninety (90) day Operational Test shall be conducted by the Contractor starting at a date as directed by the NHDOT, after opening to traffic. Beginning with that date, the System shall be observed in live operations by the Contractor and the NHDOT for a minimum of two (2) months to cover a monthly audit cycle.
Factory Acceptance Test	The testing performed by the Contractor to prove the functionality of the system in accordance with *Appendix C:*

	Requirements and Deliverables.
Final System Acceptance	Final System Acceptance will be considered by the State to have occurred when, the State in its sole discretion, determines that Contractor has complied with all of the completion requirements set forth for the Project in this Agreement.
Firm Fixed Price Contract	A Firm-Fixed-Price Contract provides a price that is not subject to increase, i.e., adjustment on the basis of the Vendor's cost experience in performing the Contract
Fully Loaded	Rates are inclusive of all allowable expenses, including, but not limited to: meals, hotel/housing, airfare, car rentals, car mileage, and out of pocket expenses
GAAP	Generally Accepted Accounting Principles
Governor and Executive Council	The New Hampshire Governor and Executive Council.
GUI	Graphical User Interface
Identification and Authentication	Supports obtaining information about those parties attempting to log on to a system or application for security purposes and the validation of those users
Image Toll (IToll)	A transaction that is an apparent violation at the time it was created at the lane level, but upon the violation image processing a valid ETC account with a matching license plate is found and the violation is subsequently converted to a toll transaction, posted to the customer's account.
Implementation	The process for making the System operational for processing the Data.
Implementation Plan	Sets forth the transition from development of the System to full operation, and includes without limitation, training, business and technical procedures.
Information Technology (IT)	Refers to the tools and processes used for the gathering, storing, manipulating, transmitting, sharing, and sensing of information including, but not limited to, Data processing, computing, information systems, telecommunications, and various audio and video technologies.
Input Validation	Ensure the application is protected from buffer overflow, cross-site scripting, SQL injection, and canonicalization
Interim Maintenance	The Phase of the project beginning July 1, 2012 to June 30, 2013
Intrusion Detection	Supports the detection of illegal entrance into a computer system
Invoking Party	In a dispute, the party believing itself aggrieved
Key Project Staff	Personnel identified by the State and by the contracted

	vendor as essential to work on the Project.
Licensee	The State of New Hampshire
Maintenance	The phase of the Project immediately subsequent to Provisional Final System Acceptance to June 30, 2017 with the potential of two (2) – two (2) year optional extensions at the sole discretion of the state.
Maintenance On-line Management System (MOMS)	An automated, fully integrated system that monitors the status of operational equipment in real time, records equipment and process failures, notifies Maintenance personnel, generates and tracks orders, maintain preventative Maintenance schedules, generated repair history, and maintains parts inventory and asset management as set forth in *Appendix C: Requirements and Deliverables.*
Non Exclusive Contract	A contract executed by the State that does not restrict the State from seeking alternative sources for the Deliverables or Services provided under the Contract.
Non-Software Deliverables	Deliverables that are not Software Deliverables or Written Deliverables, e.g., meetings, help support, services, other
Normal Business Hours	Normal Business Hours – 8:00 a.m. to 5:00 p.m. EST, Monday through Friday excluding State of New Hampshire holidays. State holidays are: New Year's Day, Martin Luther King Day, President's Day, Memorial Day, July 4th, Labor Day, Veterans Day, Thanksgiving Day, the day after Thanksgiving Day, and Christmas Day. Specific dates will be provided
Notice to Proceed (NTP)	The State Contract Manager's written direction to the Vendor to begin work on the Contract on a given date and time
OCR	Optical character recognition software used to automatically extract characters an/or numbers from an image of the data.
ORT	Open Road Tolling. A system that electronically collects tolls while vehicles pass through the tolling zone at highway speeds.
ORT Host Central Processing System	The back office central computer systems that process the transactions from the ORT controllers, and interfaces to the IAG CSC/VPC or to the Existing Central Host (dependent upon option selected by the Agency) to post the transactions for further customer and violations processing.
Operating System	System is fully functional, all Data has been loaded into the System, is available for use by the State in its daily operations.
Operational	Operational means that the System is operating and fully functional, all Data has been loaded; the System is available

	for use by the State in its daily operations, and the State has issued an Acceptance Letter.
Order of Precedence	The order in which Contract/Documents control in the event of a conflict or ambiguity. A term or condition in a document controls over a conflicting or ambiguous term or condition in a document that is lower in the Order of Precedence
Project	The planned undertaking regarding the entire subject matter of an RFP and Contract and the activities of the parties related hereto.
Project Team	The group of State employees and contracted Vendor's personnel responsible for managing the processes and mechanisms required such that the Services are procured in accordance with the Work Plan on time, on budget and to the required specifications and quality
Project Management Plan	A document that describes the processes and methodology to be employed by the Vendor to ensure a successful project.
Project Managers	The persons identified who shall function as the State's and the Vendor's representative with regard to Review and Acceptance of Contract Deliverables, invoice sign off, and review and approval of Change Requests (CR) utilizing the Change Control Procedures (CCP)
Project Staff	State personnel assigned to work with the Vendor on the project
Proposer	Any individual, firm, or corporation who has submitted a Proposal on the Project and who has met the minimum requirements established by the Agency for Proposal evaluation. Also referred to as "Vendor".
Proposal	The submission from a Vendor in response to the Request for a proposal or statement of work.
Provisional Final System Acceptance	Provisional Final System Acceptance will be considered by the State to have occurred when, the State at its sole discretion, determines that the Contractor has complied with all of the completion requirements set forth in the contract documents and successful completion of Phase IIB (Installation, System Acceptance Testing, and Commissioning)
Regression Test Plan	A plan integrated into the Project Management Plan used to ascertain whether fixes to defects have caused errors elsewhere in the application/process.
Review	The process of reviewing Deliverables for Acceptance
Review Period	The period set for review of a Deliverable. If none is specified then the review period is fifteen (15) business days.
RFP (Request for Proposal)	A Request For Proposal solicits Proposals to satisfy State functional requirements by supplying data processing product

	and/or Service resources according to specific terms and conditions
Role/Privilege Management	Supports the granting of abilities to users or groups of users of a computer, application or network
Schedule	The dates described in the Project Management Plan for deadlines for performance of Services and other Project events and activities under the Contract
SaaS	Software as a Service- Occurs where the COTS application is hosted but the State does not own the license or the code.
Service Level Agreement (SLA)	A signed agreement between the Vendor and the State specifying the level of Service that is expected of, and provided by, the Vendor during the term of the Contract.
Services	The work or labor to be performed by the Vendor on the Project as described in the Contract.
Software	All custom Software and COTS Software provided by the Vendor under the Contract
Software Deliverables	COTS Software and Enhancements
Software License	Licenses provided to the State under this Contract
Solution	The Solution consists of the total Solution, which includes, without limitation, Software and Services, addressing the requirements and terms of the Specifications. The off-the-shelf Software and configured Software customized for the State provided by the Vendor in response to this RFP.
Specifications	The written Specifications that set forth the requirements which include, without limitation, this RFP, the Proposal, the Contract, any performance standards, Documentation, applicable State and federal policies, laws and regulations, State technical standards, subsequent State-approved Deliverables, and other Specifications and requirements described in the Contract Documents. The Specifications are, by this reference, made a part of the Contract as though completely set forth herein.
State	Reference to the term "State" shall include applicable agencies as defined in Section 1: INTRODUCTION of this RFP.
Statement of Work (SOW)	A Statement of Work clearly defines the basic requirements and objectives of a Project. The Statement of Work also defines a high level view of the architecture, performance and design requirements, the roles and responsibilities of the State and the Vendor. The SOW defines the results that the Vendor remains responsible and accountable for achieving.
State's Confidential Records	State's information regardless of its form that is not subject to public disclosure under applicable state and federal laws and regulations, including but not limited to RSA Chapter 91-A
State Data	Any information contained within State systems in electronic

	or paper format.
State Fiscal Year (SFY)	The New Hampshire State Fiscal Year extends from July 1st through June 30th of the following calendar year
State Project Leader	State's representative with regard to Project oversight
State's Project Manager (PM)	State's representative with regard to Project management and technical matters. Agency Project Managers are responsible for review and Acceptance of specific Contract Deliverables, invoice sign off, and Review and approval of a Change Proposal (CP).
Subcontractor	A person, partnership, or company not in the employment of, or owned by, the Vendor, which is performing Services under this Contract under a separate Contract with or on behalf of the Vendor
System	All Software, specified hardware, and interfaces and extensions, integrated and functioning together in accordance with the Specifications.
System Integrator	The selected Contractor on this Project. See "Contractor".
TBD	To Be Determined
Technical Authorization	Direction to a Vendor, which fills in details, clarifies, interprets, or specifies technical requirements. It must be: (**1**) consistent with Statement of Work within statement of Services; (**2**) not constitute a new assignment; and (**3**) not change the terms, documents of specifications of the SOW.
Test Plan	A plan, integrated in the Work Plan, to verify the code (new or changed) works to fulfill the requirements of the Project. It may consist of a timeline, a series of tests and test data, test scripts and reports for the test results as well as a tracking mechanism.
Term	The duration of the Contract.
Transition Services	Services and support provided when the contracted vendor is supporting system changes.
User Management	Supports the administration of computer, application and network accounts within an organization
Vendor/Vendors	The contracted individual, firm, or company that will perform the duties and Specifications of the contract.
Verification	Supports the confirmation of authority to enter a computer system, application or network
Violation Enforcement	Video based system located at toll lanes used to record

System (VES)	license plate images of selected vehicles (to be defined in the Business Rules) in video form in accordance with this Document.
Walk Through	A step-by-step review of a specification, usability features or design before it is handed off to the technical team for development
Warranty Period	A period of coverage during which the contracted vendor is responsible for providing a guarantee for products and services delivered. For this contract the period will be one (1) year.
Warranty Releases	Code releases that are done during the warranty period.
Warranty Services	The Services to be provided by the Vendor during the Warranty Period.
Warranty Work	The Work to be provided during the Warranty Period under the terms of the Warranty as set forth in the Contract Documents.
Work	The term Work, as used herein, includes all work which, in the judgment of the State, is necessary for completion of the construction and the Project under the Contract Documents and includes, without limitation, all plant, labor, materials, equipment, systems, services and software and other facilities, installation, testing, operations and maintenance and other things necessary or proper for or incidental to the carrying out and completion of the terms of the Contract Documents. Furthermore, without limiting the generality of the foregoing, the Work includes and is the result of performing or furnishing Design professional services and construction and installed equipment required by the Contract Documents.
Work Plan	The overall plan of activities for the Project created in accordance with the Contract. The plan and delineation of tasks, activities and events to be performed and Deliverables to be produced under the Project as specified in Appendix C. The Work Plan shall include a detailed description of the Schedule, tasks/activities, Deliverables, critical events, task dependencies, and the resources that would lead and/or participate on each task.
Written Deliverables	Non-Software written deliverable Documentation (letter, report, manual, book, other) provided by the Vendor either in paper or electronic format.

APPENDIX I: FORMS AND EXHIBITS

The following pages provide the referenced forms from the RFP document. Note that Exhibits are provided for information purposes only and are not required to be completed as part of the RFP submission.

List of Forms Included

- Form 1: Vendor And Subcontractor Information Statement
- Form 2: Past Performance
- Form 3: Vendor Referenced Projects
- Form 4: Key Staff References
- Form 5: Proposal Transmittal Letter
- Form 6: Compliance Matrix
- Form 7: Pricing Worksheets
- Form 8: TRMI Non-Disclosure Agreement
- Form 9: Vendor Inquiry Form
- Exhibit 1: TRMI Software agreement
- Exhibit 2: ICD Lane to CSC
- Exhibit 3: ICD Host
- Exhibit 4: E-ZPass Business Rules
- Exhibit 5: Lane System Business Rules
- Exhibit 6: ORT Business Rules
- Exhibit 7: Asset Inventory
- Exhibit 8: New Toll Rates – July 1, 2009 Hampton
- Exhibit 9: NH Toll Classification Chart
- Exhibit 10: Toll Plaza Layouts
- Exhibit 11: NH DoIT Standards List
- Exhibit 12: Hooksett ORT Project Special Provisions 10008.43
- Exhibit 13: Hooksett ORT Project Special Provisions 10008.44